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Original Articles.

ETIOLOGY AND PATHOLOGY OF LOSS OF VISION FROM THE ACCESSORY SINUSES.

BY LEON E. WHITE, M.D., BOSTON.

So far as can be determined, from discussions with men having to do with these borderline cases, the opinion almost universally held is that accessory sinus blindness presupposes purulent infections. To illustrate: In a recent conversation with a noted cerebral surgeon who has given this subject considerable attention, he expressed his conviction that if loss of vision ever resulted from the sinuses it would only occur when they were most evidently diseased. When mention is made of opening them for the relief of blindness, the first question almost invariably is, "Did you find pus?" While cases have occasionally been reported of loss of vision from non-purulent infections, this old belief of the necessity of finding pus is so persistent that it warrants reconsideration.

ETIOLOGY.

The earlier writers dwelt largely upon the anatomical relations of the optic nerve and gave undue emphasis to the theory that purulent infections in the sinuses spread to the optic nerve because only a very thin bone intervened.

Gradle's views of the etiology of blindness shows a beginning reaction from this idea. He says:

"I believe that I am justified in stating" (contrary to the teachings of Onodi and Loeb) "that the anatomic relations of the sphenoid and ethmoid cells to the optic canal are immaterial when it comes to a question of optic nerve involvement in accessory sinus disease. The trouble is transmitted by the soft tissues alone."

In my first cases I expected to find the sinuses filled with pus, but this happened so rarely that it only helped to explain the etiology in but a few cases.

I did not, at the time, realize how difficult it was to determine, histologically, just where the dividing line was to be drawn between suppurative and non-suppurative conditions. Even when pus had been previously seen in the nose, it was found to be extremely difficult to detect it during the operation, mixed, as it necessarily must be, with blood. In not a few cases where pus was not seen either before or at the time of operating, the slides would frequently show dead cells, detritus and cocci in the lymph channels.

When Sluder's masterly work appeared, I thought hyperplasia might explain the etiology of many cases, as it probably does when extreme. But it has not been my good fortune

* Read before the Amer. Laryng., Rhinol., and Otol. Society at Atlantic City June 3, 1921.

to find enough macroscopic hyperplasia to warrant it being considered the *principal* cause for the loss of vision. Nor did the sections, when viewed under the microscope, show changes sufficient to so consider it, although Dr. Jonathan Wright aptly says on this point:

"Are you, or is any man, in a position to state definitely just how much tissue change is sufficient to cause impairment of vision? I am sure I never was. I think it reasonable to suppose that is more or less dependent on locality, individual configuration of the nasal chambers and the sinuses, and many other factors, not forgetting the general one, which is systemic and undefinable. No factor, not even 'tissue change,' or obstruction, is ever the sole etiological factor in any disease anywhere."

Being, then, at a loss to explain the etiology, I went carefully over my cases and discovered that the one almost constant finding was enlargement of the turbinate tissue adjacent to the sphenoidal ostium. It was also quite usual to have a posterior deflection of the septum crowding the already poorly ventilated regions of the posterior sinuses. Then, in operating, the superior turbinates were generally found to be markedly enlarged and it was necessary to take out more tissue than one would have thought necessary from previous inspection, before good exposure of the wall of the sphenoid was obtained.

While Onodi did not recognize the full importance of blocking to ventilation and drainage, he has this to say in his explanation of the importance of pressure by the large cystic turbinates:

"The so-called bone cyst is a structural anomaly known as the turbinate cell. Diseased, these turbinate cells may attain various sizes. They appear in the superior and middle turbinates, and, as the turbinate cell of the superior turbinate, according to our observations, may be in close relation to the optic nerve; it will be seen that the practical importance of the turbinate cell is due to the pathologic changes and growth, especially through pressure."

"In cases under our observation the turbinate cell appeared nine times in the middle and twice in the superior turbinates; the turbinate cells twice opened into the middle meatus, at other times in the superior. Its length varied from 8 to 20 mm., the width from 5 to 14 mm., the height from 7 to 16 mm."

Thus, in reviewing my cases, it seemed that the only consistent explanation of the etiology, applicable to most of the doubtful ones, was to be found in the size and position of the middle and superior turbinates.

The following extracts are taken from the published reports of these cases and show the unconscious evolution of this theory. In the earlier ones, little attention was paid to the middle turbinate, in a few they were not mentioned, but on looking back I feel there was some obstruction in practically all. Abstracts from the records of three other cases (5, 7, 20) are also given which, while noted at the time, did not then appear of sufficient importance to be incorporated in the published reports. The last twelve cases all indicate how important this matter is now considered.

Case III.

"On examination, there was found on the left a moderate deflection of the septum and an enlarged and swollen middle turbinate completely blocking the superior meatus. * * * Right middle turbinate was swollen but not as firmly wedged in as the left."

Case VI.

"Septum is deflected to left (the eye affected) and middle turbinate greatly swollen. * * * Posterior portion of left middle turbinate was obstructing the opening to the sphenoid."

Case IX.

"Right middle turbinate tightly wedged between septum and ethmoidal wall.

Case XII.

"A posterior deviation of the septum crowded the left middle turbinate so as to obstruct the sphenoid and posterior ethmoid."

Case XIII.

"Marked deviation of the septum and hypertrophied middle turbinates."

Case XIV.

"A slight deviation of the septum high up and both middle turbinates were greatly swollen, blocking the posterior ethmoids."

Case XVI.

"Marked deviation of the septum to the right and the middle turbinate tightly wedged between it and the outer wall."

Case XVII.

"Both middle turbinates were greatly hypertrophied, the left the most marked and especially obstructing the sphenoid."

Case XVIII.

"The septum was deflected to the opposite side but the turbinate on the affected side was enlarged and especially obstructive."

Case XIX.

"Marked hypertrophy of the middle turbinate on the affected side, evidently obstructing the accessory sinuses."

Case XXI.

"Both middle turbinates were enlarged and obstructive."

Case XXII.

"The middle turbinate on the affected side was enlarged and obstructive."

Case XXIII.

"The septum was deflected; and while the anterior end of the right middle turbinate was small, the posterior portion was large and obstructive."

Case XXIV.

"The right middle turbinate was somewhat obstructive posteriorly. The middle turbinate, which proved to be much larger than it appeared, was removed."

Case XXV.

The posterior portion of the left middle turbinate seemed somewhat enlarged."

Case XXVI.

"Nasal examination disclosed an enlarged obstructive middle turbinate."

Case XXVII.

"A slight deflection of the septum to the left, which extended far back, crowding somewhat the large, unhealthy middle turbinate on that side. The right middle turbinate was also enlarged, soft to the touch, and about it there was considerable secretion. Both middle turbinates, without doubt, obstructed the posterior sinuses."

Case XXVIII.

"Nasal examination revealed marked deflection of the septum to the right, but the turbinates did not appear especially hypertrophied or obstructive." (This case recovered without operation.)

Case XXIX

"Nasal examination revealed inflamed middle turbinates. They shrunk, however, under cocaine, to the normal size, and as they did not seem to be especially obstructive, the prediction was made that recovery would take place without operation." (Recovery did so take place.)

The following notes on these *three* cases did not appear with the reports, but are taken from my records:

Case V.

"Examination of nose revealed a somewhat deflected septum to the right and middle turbinate was rather crowded."

Case VII.

Hypertrophy of middle turbinates.

Case XX.

Right middle turbinate considerably enlarged and reddened. Cotton swabs, however, could be placed between it and ethmoidal wall (so that it was felt case would recover without operation, which it did.)

The following *four* cases, which appear at the end of this paper, are added to make the record more complete:

Case XXX.

Septum deflected to right posteriorly crowding an enlarged middle turbinate and evidently blocking the posterior sinuses. Left middle turbinate also moderately hypertrophied.

Case XXXI.

The right middle turbinate was somewhat enlarged, and the septum bent slightly to that side.

Case XXXII.

The septum was badly deflected high up, with enlarged middle turbinates in close contact with it.

Case XXXIII.

A moderately high posterior deviation of the septum to the left in contact with a somewhat hypertrophied middle turbinate. There appears to be considerable obstruction to the drainage of the posterior sinuses.

To Summarize:

In the last 22 cases mention is made of obstruction by the middle turbinate in all but two. In the first 10 it is mentioned but five times, as little of importance was at first attached to it.

Thus, the frequency with which these middle and superior turbinates have been found hypertrophied and most evidently blocking the posterior sinuses suggested the following theory as to etiology, in many cases where pus cannot be detected and the roentgenograms are practically negative. While it may be premature to present this theory without more data than I have been able to secure, it is done to obtain your views as to its plausibility and to solicit your coöperation in accumulating proof of its correctness.

The theory, in short, is that these superior turbinate structures high up in the roof of the nose, gradually become enlarged and obstructive. There is an increase in the basal connective tissue, *i.e.*, a certain amount of hyperplasia, so that eventually the posterior sinuses are practically blocked. Then some infection takes place in these sinuses which, if not al-

ready occluded by the hypertrophied turbinates, most readily becomes so by a very slight increase in their size. Thus a low grade inflammatory process commences, generally of the exulative but non-suppurative type, the swelling and infiltration incident to it spreads by continuity of tissue to the optic nerve, or if the sinuses are completely shut off, there may be a closed empyema with infection to the nerve through the circulation,—not in all cases, of course, but in those which, through some anatomical peculiarity, are rendered especially vulnerable. The infection may be confined to the region superior and posterior to the middle turbinates, thus explaining why so little is seen on inspection and why roentgenograms show but slight, if any changes, *i.e.*, only what would be expected from an acute non-suppurative inflammatory process. The examiner should visualize these conditions somewhat, as it is not possible by any method of description to tell exactly how to determine these turbinate abnormalities. It is comparable to the difficulty of expressing to others why, in palpating the two mastoids, the skilled otologist can tell that the one is filled with pus, with cellular structures broken down, and the other normal. It is simply the little edema that to the experienced examiner means so much, and yet it is so slight that only by long practice can one be reasonably certain of his diagnosis.

In my efforts to state a simple understandable theory it is impossible to consider the manifold variations and the many exceptions that one is bound to meet in these cases. Nature is complex, but the mind of man seeks repose in a simplicity of cause and effect which does not usually exist.

As to whether or not the damage to the optic nerve occurs secondary to involvement of the sympathetic system in this region, as Dr. W. H. Haskin believes, I am unable to say. His theory seems a good one and the following is quoted:

"The fibres of the carotid and cavernous plexuses are in intimate contact with these areas (diseased cells or sinuses) and they are the vasomotor and trophic nerves, the pupil dilating nerves and those which control the unstriped muscles of the eye and the orbit, and they all belong to the sympathetic nervous system."

PATHOLOGY.

Having meditated much upon the pathology and discussed it, or the lack of it, not a little with many of my confrères without especially satisfactory results, the conclusions I have drawn are so similar to those in the following paragraph that I will read it:

"Sidepaths in Medicine," by Jay Perkins, M.D., Providence, R. I. "The study of pathology is an absolute necessity to one who would have a knowledge of medicine, but if we get into the habit of thinking a disease must present the pathology as taught and seen in the autopsy room before we make a diagnosis of that disease, we are, many times, of very little use to the patient, because we fail to recognize the nature of their ailments while they are yet in a curable stage."

It is well to bear in mind that noses filled with polypi and pus rarely produce any effect on the vision. It is also well to remember that cases with multiple sclerosis, brain tumors and various constitutional conditions may incidentally have marked pathology in the nose, so that no matter how much one sees on inspection, other possible causes should always be considered. The classification I have tried to make is: first, direct extension by continuity from the source of infection to the optic nerve; second, toxemia from some infective process; third, bacteremia or focal infection; and fourth, hyperplasia.

The theory of *Direct Extension*, it seems to me, has never received the emphasis it merits. If it is the correct explanation of what takes place in a considerable portion of the cases, it helps to clarify this whole subject. Let me quote Onodi again on this point:

"We have two accurate observations, made by Ortman and Hajek, who have established the cause of infection by way of the blood vessels and tissue continuity. • • •

"In Ortman's case the body of the sphenoid and the membranes showed the presence of diplococci. This finding showed that infection of the meninges may take place by direct continuity. • • •

The case observed by Hajek showed • • • a diffuse, fibrous, suppurative, acute pachymeningitis interna, and leptomeningitis of the base and convexity of the brain with acute internal hydrocephalus, inflammation of the left ethmoid cells, edema of the mucosa of the maxillary sinuses. • •

"That infection may take its course through tissue continuity and the blood vessels, has been proven; that it may make its way through the lymph vessels, along the lymph spaces of the olfactory nerves through the openings of the lamina oribrosa, is possible, but has not been, up to date, microscopically and bacteriologically confirmed."

The theory, as I conceive it, is that by direct extension an acute inflammatory infection originating in the posterior sinuses, rapidly extends by continuity of tissue to the sheath or even to the optic nerve itself. These infections are frequently non-suppurative with practically negative roentgenograms. An obstructive middle turbinate, and only the posterior portion of that, may be all that is found.

Because it is not always possible to secure

sections showing marked changes, many have questioned the possibility of the sinuses being a factor in any of these borderline vision cases. Why, they ask, do you get loss of vision with little or nothing to be seen in the nose and yet rarely any visual disturbance in those so evidently diseased? The explanation, it seems to me, is that in chronic cases nature usually walls off the eye, the optic nerve and, in fact, the body from the source of infection. With this walling off, the blood also acquires an antitoxic immunity. An antrum, a frontal or any accessory sinus may be filled with the most offensive pus and be lined with exuberant granulations, yet the patient suffers but little, if at all. Toxemia or bacteremia may possibly result, but as a direct causative factor these nasty sinuses which we have all been looking for in acute visual disturbances, play but a minor rôle.

While Onidi did not seem to take into account this walling off process, he mentions that marked infections do not necessarily impair the vision, as follows:

"We are acquainted with several cases in which, in spite of the presence of suppuration and destruction of the bony walls of the sphenoid sinus, the sight was not impaired. Berger and Tyrmann mention the slow erosion or wearing away of separate parts of the sphenoid body, though no derangement of sight took place, but later meningitis appeared. Baratoux mentions a case in which a large part of the sphenoid body was thrown off through the nose, causing no disturbance whatever. Hajek saw a number of cases of syphilitic destruction of the anterior wall of the sphenoid sinus without special symptoms of any other kind. Flatau reports 26 cases of empyema and caries of the sphenoid sinus, but mentions no derangement of sight. Foucher describes the case of a girl of 15 with necrosis of the turbinates and the sphenoid sinuses; antiluetic treatment was instituted, bone sequestra were formed and the girl died; sight disturbances were not observed. The observations of Schaffer, Onodi, Schmiegelow and Hoffman also show that in many cases of diseased sphenoid sinuses no changes in the function of the optic nerve took place."

In the chronic empyemas, nature generally throws out a barrier which walls them off from the adjacent structures, otherwise purulent infections in the sinuses and likewise in the mastoid, would more frequently invade the cranial cavity. While it is true that through some reinfection or a breaking down or erosion through the barrier there occasionally occur serious intracranial infections, these are of rather infrequent occurrence. The otologist well knows how important it is to await the formation of the barrier which separates his mastoid from the meninges and lateral sinus before he advises operative interference. While he may not be able to demonstrate pathologically what happens in these acute infections, he learns from his clinical experience that during the first week or ten days there is more or less general infection, frequently associated with hyperpyrexia and accompanied by tenderness over and about the mastoid together with more or less pain. Then the mastoid becomes separated from the general system by this walling off process and although its cellular structure may be breaking down, the infection is practically a localized one and pain, tenderness and temperature usually subside.

This is comparable to what may happen in the accessory sinuses. When an acute infection occurs in the sphenoid or posterior ethmoid, there may be an almost immediate invasion of the tissue about the optic nerve, including the sheath of the nerve or the nerve itself. When, on the other hand, there is an infection in a more remote sinus, it fortunately becomes walled off before the optic nerve is reached. Should the infections, however, persist, there may be poured into the system a certain amount of bacteria and toxins which may produce an optic neuritis, or, for that matter, a neuritis of any nerve.

What I especially desire to emphasize is that while subacute or chronic infections may be an occasional factor in involvement of the optic nerve, the acute infections with but little discoverable evidence in the nose are of far greater consequence. The fact that it is so easy to overlook this condition leads me to dwell upon its importance.

In but few of my cases was there marked involvement of the sinuses, and in none was there offensive pus. The important thing to look for is obstruction to the posterior sinuses. In my first ten cases the nasal examination was reported negative in seven, while in 17 some obstruction to drainage was found in all. It required these 10 cases to teach me what to look for; and without doubt were they to be again examined I should not pronounce them all negative. Let me emphasize again that normal noses do not produce loss of vision. But in many, that on first inspection *seem* normal, there *is infection*, even if not evident. I think it may be stated in a general way that if the inflammation has simply produced pressure by a swelling about the nerve and has not involved the nerve itself, the prognosis is good; while if it involves the nerve (if there is a true optic neuritis), complete recovery is much less liable to take place. In the latter the sinuses should be drained and drained speedily.

For one should remember that the optic nerve is really not a nerve but a lobe of the brain. It is easily destroyed and does not regenerate. Parsons says of it:

"The so-called optic nerve together with certain parts of the retina, constitutes a lobe of the brain, and has therefore the characteris-

ties of the central nervous system. Hence the nerve-fibres are devoid of a sheath of Schwann and the interstitial substance is neuroglia."

In a conversation with Dr. Sluder as to the difficulty I was having in obtaining slides which showed much pathology, he told me how much help he had received from Dr. Jonathan Wright and suggested that I write to him, which I did, and his kindly letters have so many points applicable to this subject that I have asked his permission to make extracts, justly feeling that it would be selfish not to share the wisdom therein contained. In one letter written in reply to my inquiry as to the best methods of investigating the pathology, he says:

"The reasons the general pathologist fails to recognize the basis of much nasal clinical manifestation, is that it frequently happens that the tissue submitted is too small for a definite opinion, or is from a locality not directly associated with the trouble—for instance, it not infrequently happens that the nasal surface of the sphenoid is fairly normal and that of the cavity diseased—the tissue may be from the middle turbinate rather than from a sinus wall, etc. Chiefly, however, it is because the phenomena of physiological change are so confused with those of the pathological. There is considerable difference in even the normal structure dependent on age and season or climate, but next to the one I have emphasized, probably the most frequent practical difficulty comes from the ravage wrought in the process of getting rid of the bone salts to allow sectioning."

In another letter he says:

"I do not think I realized how impossible it is for the general pathologist to follow the bone changes in the nose intelligently until I began to go over Sluder's work, but it is now quite evident that at least so far as the nose is concerned that objective study of tissue changes in the chronic inflammations must go hand in hand with clinical study. In fact, that is the only rational way to study inflammations anywhere. When a man has a piece of tissue brought to him and has no first-hand knowledge of the dynamic processes which have put that tissue in its condition, how can he give the clinical man what he wants? He can say if a thing is cancer or not, but in chronic inflammations he has a static condition thrust upon his attention when really it is a process which the man bringing it to him wants to know about. In the nose no man, alive or dead, can or ever could tell where the normal leaves off in adults and where the abnormal begins. It is difficult enough for the conscientious clinical observer of the process in situ (the man who sees the thing going on in a patient with whose general condition he is familiar) it is hard enough for him to say whether it is really a menace to his patient's health or his comfort, but what can the pathologist tell him with looking at his bit of tissue in a matter where the so-called abnormal process is merely a continuation, exaggerated if you will, of normal physiological development or retrocession of erectile or lymphoid tissue.

"It is almost instinctive groping after lines of differentiation which exist no more here than between other artificialities erected by man for the help of his puny powers of comprehension, landmarks of his memory, the line between inflammation and the turgor of physiological growth, the line between physiological and pathological, whether of the lymphoid tissue in the throat or the erectile tissue in the nose. The laboratory man knows little or nothing of the looks of the nasal chambers in childhood, in adult life and in old age, and the very greatest differences are familiar to us by virtue of our daily observations in the clinic. What is plainly abnormal in one age may not be so at all in another. But these are gross distinctions we are familiar with as clinicians."

Possibly by comparing what happens to some of the other cranial nerves enlightenment may be gained on the pathology in these vision cases. There is not infrequent paralysis of the facial nerve, from some slight disturbance in the middle ear. This is generally known as Bell's palsy. Reik claims there is always a preceding non-suppurative middle ear infection, yet it is of such a slight or transitory nature that the drum membrane appears practically normal. The fact that both the facial and optic nerves pass through a bony foramen and are thereby rendered more susceptible to inflammatory affections, would seem to make this comparison of value. When there is an inflammation of the middle ear sufficient to cause a facial paralysis and yet not active enough to produce much, if any, change evident even through a *transparent* drum membrane, why expect to discover in the posterior portion of the nose a change so *marked* as to be evident through the *mucous membrane covered walls of* the accessory sinuses, not to speak of the difficulty of inspecting these walls owing to the presence of a middle turbinate? The middle ear may well be compared to the sphenoid, the eustachian tube to the ostium. When closed an inflammatory process takes place sufficient in the one to cause facial paralysis, in the other blindness.

Let me read a few extracts from Reik: In an article on the relationship between otitis media (non-suppurative) and facial paralysis of the refrigeratory type, he says:

"In the majority of cases, if not indeed in all, of facial paralysis of the refrigeratory or rheumatic class, an acute or sub-acute otitis media is an intermediary condition between the exposure to cold and the appearance of the paresis."

He quotes Dr. Herter's opinion as to the pathology as follows:

"Neuritis of the facial nerve is a cause of a very large proportion of all cases of peripheral palsy. The neuritis is commonly called rheumatic, whatever that may mean. It is true that the palsy generally comes on after exposure to cold. Occasionally the subjects are distinctly gouty or rheumatic, but usually there is no evidence of either condition. It was formerly thought that exposure to cold caused facial paralysis by paralyzing the terminations of the nerve in the facial muscles. There is now good reason to believe that the infection always depends upon an inflammation of the trunk of the nerve (perhaps involving chiefly the sheath) within the Fallopian canal, and there is no evidence that inflammation ever involves the nerve after it emerges from the canal. * * *

"The facial nerve is vulnerable only in that portion of the Fallopian canal which extends in close proximity to the middle ear. The Fallopian canal is separated from the middle ear by an extremely thin bone which frequently shows dehiscences so that any inflammatory condition of the middle ear readily extends to the sheath of the facial nerve. * * *

"Patients with Bell's palsy generally have a history of some slight disturbance in the ear a day or two before the onset of the paralysis, but *many of the ears have cleared up so that they appear practically normal on inspection.*"

In his text-book on Diseases of the Ear, Nose and Throat, published in 1911, Reik says:

"In every case of a refrigeratory facial paralysis the ear should be immediately and carefully examined and if there is the slightest reason for supposing middle ear trouble, the tympanum should be opened at once. * * * In fact, the author is inclined to urge tympanotomy in every case at the earliest possible moment, even when you cannot secure visible evidence of intratympanic inflammation, because, as has been pointed out, there probably is disease there which is not clearly perceptible. A clean incision through the tympanic membrane can do no harm if there is no disease there, and the wound will heal without causing any damage to function."

As these references were rather old, I wrote Dr. Reik as to his present views, and his reply on January 13, 1921, is as follows:

"In regard to my views upon refrigeratory facial paralysis, I can only say that they have not changed in any sense since the publication of the articles you refer to.

"In every case of a refrigeratory facial paralysis that I examined after expressing the views you refer to, I was able either to demonstrate the existence of acute or subacute middle ear inflammation, or to show by the hearing tests that there was an abnormal middle ear condition, even though there were no visible signs of the disease. Paracentesis and middle ear treatment certainly facilitated materially the progress of these cases.

"I think the comparison that you draw between this condition and visual defects, possibly due to accessory sinus disease, is quite logical. The explanation in both cases may lie in an irritation or inflammation of the nerve sheath, with resulting sensory disturbance, without the actual presence of pus or infective material in the adjacent cavities. Operation is certainly justifiable under the conditions that you suggest."

There is one other cranial nerve,—the sixth,—that occasionally becomes involved in an inflammation of the mastoid. This nerve also passes through a canal and although a fibrous one, it is just where the nerve is vulnerable. The following is taken from Perkins' article, "Abducens Paralysis and Otitis Media Purulenta" (*Annals of Otology*, 1910):

"The cause of the occurrence of abducens paralysis and the key to its solution will be found in the peculiar anatomic arrangement by which the sixth nerve gains its position in the outer wall of the cavernous sinus and comes into relation with the ophthalmic division of the fifth, the fourth, and the third cranial nerves, which it does immediately anterior to the first intracranial portion of the carotid artery. Anterior to this, there is no special reason why one of these nerves should be more frequently involved than the others. Posterior to this point, however, the sixth nerve is comparatively isolated and passes through a fibrous canal called 'Dorello's Canal' * * * which begins where the nerve pierces the dura in the posterior fossa. * * * Now it is evident that narrowing of this canal may result from inflammatory thickening of its walls, or this thickening may arise from edema, caused by inflammation in the neighboring dura or bone. This narrowing, however produced, would result in pressure upon the nerve and abducens paralysis; or the inflammation may extend to the nerve itself, *causing neuritis with consequent loss of function.*"

Toxemia. It is conceded that retrobulbar and optic neuritis can be caused by alcohol, lead, tobacco, quinine, optochin, ethylhydrocuprein, arsenic, lues, etc., so that reasoning by analogy there is little doubt but that toxins originating in the accessory sinuses, or for that matter anywhere in the body, may have similar action on the optic nerve. The onset is usually less violent than where there is a direct extension and is more apt to be a causative factor in chronic types. There is generally sufficient time in these subacute or chronic cases to make a careful differential diagnosis, and here, roentgenograms may prove of great assistance.

In the 33 cases studied, toxemia was considered the chief factor in eight. In four (8 and

9) diseased teeth were extracted; and the antra opened in three.

It is quite generally conceded that any *pus focus* within the body may be a factor in these vision cases, and while this paper deals only with the accessory sinuses, other possible sources must *not* be overlooked.

Bacteremia. It has been demonstrated by Billings that infectious microörganisms may be carried in the blood stream or by the lymph channels from the foci of infection in the teeth, tonsils and accessory sinuses, to the terminal blood vessels in various regions of the body. He has shown how the inoculated blood vessels become more or less occluded by endothelial proliferation and leukocytic infiltration and that the bacteria escape through the vessel walls into adjacent tissue, so that there would seeem little doubt but that bacteria within the accessory sinuses may also travel *via* the blood stream and lymph channels to the optic nerve. Why are we so greedy to accept diseased tonsilar crypts as a cause of arthritis of the great toe, but so slow to accept the view of involvement of the optic nerve in a process so contiguous to it as accessory sinus inflammation? Billings' explanation of the modus operandi in focal infection is so good and so applicable to the subject under consideration that I am led to quote the following extracts from his book on this subject:

"When the body is invaded with pathogenic bacteria the natural defenses are increased by their presence in the tissues and blood. The processes are: first, the phenomenon of positive chemotaxis with resulting leukocytosis and the accumulation of the leukocytes in the areas of infection of the tissues by the formation of local exudates, liquid (purulent) and fibrinoplastic, which may serve as walls of protection against further direct invasion; second, leukocytic phagocytosis with destruction of the invading bacteria; and third, the formation of protective antibodies in the blood and tissues. • • •

"Undoubtedly the latent pathogenic bacteria usually present in the nose and throat may acquire coincidently with exposure (to cold or following some physical or mental exhaustion) specific pathogenicity and are able to invade the host because of the lowered resistance and because of added virulency. There is an acquisition of specific pathogenicity and tissue affinity by the members of the streptococcus-pneumococcus group. • • •

"Usually a focus of infection is disregarded by the patient and physician unless it causes local discomfort. When a systemic disease occurs which present-day knowledge associates with a primary infectious focus the site of the focus must be located. The character of the systemic disease may point to the most likely location of the primary portal of infection. The primary focus of acute rheumatic fever, endocarditis, chorea, myositis, glomerulonephritis, peptic ulcer, appendicitis and chronic deforming arthritis, as examples, is usually located in the head and usually in the form of alveolar abscesses, acute or chronic tonsillitis and sinusitis. • • •

"Systemic infection and intoxication from a primary focus is usually hematogenous. The bacteria may be compared with emboli loosened from the place of origin and carried in the blood stream to the smallest and often terminal blood vessels. If virulent and endowed with specific elective pathogenic affinity for the tissues in which they will lodge, and if in sufficient number, the invading bacteria will excite characteristic reactions in the infected tissues and a sequential train of morbid anatomical lesions. The evolution of the anatomical lesions and the clinical phenomena aroused thereby are dependent on the type and virulence of the bacteria, the character of the tistue and the function of the organ involved. The specific tissue reaction consists of a local inflammation with endothelial proliferation of the lining of the blood vessel with or without thrombosis; blocking of the blood vessels; hemorrhage into the immediate tissue; positive chemotaxis with resulting multiplication of the leukocytes and plasma cells in the infected area, or fibrinoplastic exudate with local connective tissue overgrowth. • • •

"Hematogenous focal infection of the nervous apparatus, involving the gasserian and posterior spinal root ganglia and spinal cord, affords confirmation of the infectious nature of herpes, of insular sclerosis and myelitis of the spinal cord. Removal of the primary etiologic foci of infection about the upper air tract and mouth may modify favorably the course of the spinal cord infection," and if spinal cord infections, *why not*, let me add, similar infections of the optic nerve?

Hyperplasia. By this is meant a functionless overgrowth of the supporting tissue. It has been greatly emphasized by several writers as a causative factor and in the summary of one of my papers is given as the predominating lesion in 14 cases; but as it is found to be a common condition in the noses of most people subject to the sudden variations of temperature, it is so difficult to explain just what occurs that but few will concede to this hypothesis.

Hyperplasia as a predisposing factor is probably of considerable importance. It undoubtedly renders the accessory sinuses more vulnerable, as was mentioned in speaking of the new etiological theory. Hyperplasia *plus* infection and direct extension to the optic nerve, is, it seems to me, of far greater importance than the mere fact that the tissue has become hyperplastic. In my 14 cases I think it was the infection that caused the damage rather than hyperplasia.

As to the *modus operandi*, Beck believes that "in the early non-suppurative chronic form of sinus disease there results an engorgement of the optic nerve, edema and later reparative inflammation, contraction and destruction of the fine neural filaments." While no one knows what actually takes place, this is as plausible a description as any I have seen.

Whatever may be the true explanation of the pathology, it would seem at the present time advisable to recognize the clinical fact that where no other cause for the neuritis can be discovered the opening of the accessory sinuses either by depletion or by ventilation, or by getting rid of some bacteria, generally proves beneficial. Meanwhile, any patient who has been thoroughly investigated should not be deprived of the benefits of this operation just because the bacteriology or pathology is not thoroughly understood.

Let me refer to Loeb's views along this line. In calling attention to the rapidity with which serious eye symptoms may disappear after appropriate nasal treatment, he says:

"The ready recovery under the circumstances is as convincing of their nasal origin as anything could be short of autopsy findings."

While we have not been able to prove definitely to which one of the four classes each case should pathologically belong, enough evidence has been discovered to say that there is an infective process in the posterior sinuses which might readily reach the optic nerve, be it by direct continuity, by toxemia or bacteremia.

Let me here express my thanks and appreciation to Dr. Frederick H. Verhoeff, who in addition to referring several of these cases and giving me data in their eye conditions, has also spent much time on the preparation and examination of the specimens, smears and cultures.

Dr. Jonathan Wright very kindly examined the sections from the last nine cases operated upon, and as his report takes up each case more in detail than that of the other pathologists, it is embodied in this paper.

3,3739 September 26, 1919 (Case 19):

"I should suppose some of this tissue surely came from an accessory cavity and some from the nasal chambers. The latter is an edematous and fibrous hyperplasia. As to the tissue from the sinus, as I suppose, this presents less edema and more fibrous hyperplasia, a thing in itself significant for the mucosa of a sinus. (I use the term fibrous hyperplasia from long habit as indicating a more chronic process than 'increase of the connective tissue' or 'a large number of fibroblasts,' but perhaps that is not always a warrantable inference.) There is, however, without doubt, chronic inflammation of the mucosa and I should say numerous bone areas were involved.

"O. im 1/12—I think confirms this. It seems largely bone proliferation—I am referring only to the bone changes—but there can be no doubt these should be looked on as inflammatory, so marked is the fringing zone of osteoblasts and fibroblasts. Probably no such area of rarefying osteitis can be found here as is shown in the remarkable picture Fig. 4, p. 21, in Sluder's book, but the state of a chronic bone inflammation is not the less unmistakable."

3,3823 January 19, 1920 (Case 23):

"Some of the tissue is edematous hyperplasia from the mucous membrane of the nasal chambers themselves with very little connective tissue increase. Narrow strips lined on one side with columnar epithelium and devoid of glands I should imagine to be from a sinus. These also present the usual appearances of chronic inflammation in the accessory sinuses. I see no bone. Such blood vessels in the mucous membrane of the nasal chambers as are shown perhaps have some increase in low grade connective tissue around them, but show it distinctly gorged with granular detritus and the nuclear remains of leucocytes and new connective tissue cells, probably of lymphocytes too. *Chronic inflammation of the nasal and paranasal mucosa.*"

3.3833a, February 19, 1920 (Case 24):

"The tissue is apparently the lining mucosa of one of the sinuses, but I think inflammatory processes had not been very great or long existing. The cilia of the epithelium are well preserved and I see no bone. *Mucosa fairly normal for the nasal sinuses.*"

3.3839a Chron. inflam. turbinate (Case 25):

"There are areas of leucocyte infiltration around some of the gland clusters and perhaps some hyperplasia of the connective tissue, but the elements of the mucosa, epithelium, blood vessels and sinuses, glands otherwise, are not markedly affected. *Very moderate chronic inflammation of the erectile nasal mucosa.* Very likely in the middle turbinate areas."

3.3839 February 20, 1920:

"Same general character as 3.389a as to the mucosa but in the deeper layers here there are some small areas of bone, at whose periphery the cellular activities are not especially exaggerated, I should think. I presume the proximity to the bone here accounts for the general impression of more fibrosis than in the other section."

3.3897 July 29, 1920 (Case 26):

"I should suppose some of this tissue was intranasal and some intrasinusodial or perhaps all of it from near the ostium. The mucosa itself seems to present evidence of acute inflammation, maybe from a prior operative attack, but if not, then in a condition of non-traumatic subacute inflammation. The bone changes it is less admissible to ascribe to preoperative work

though I suppose this is not impossible in the etiology. However, for that, there is a rather marked fibroblastic increase along the margins of the bone areas and the nuclear elements of the bone itself are numerous and deeply stained.

"O. im. 1/12: It would take too long to go into detail as to the high power appearances, but my impression as to the conclusion coincides in a general way with the above, *i.e.*, that we have an inflammation of bone here, possibly due to operative trauma, but if this can be excluded, there seems no doubt of a morbid activity due to other causes." (There had been no prior operation in this case.)

3.4103 March 11, 1921. Turbinate (Case 30):

"This is a section through the mucosa and the underlying turbinate bone. All of it shows evidence of a moderate chronic inflammation, —hyperplastic. It is pretty well 'mussed up' with the 'decalcifyer,' but I should imagine the bone was involved too, though I would not be sure of it.

3.4103 Sinus mucosa with perhaps some small areas of inflammatory action, but on the whole fairly normal. There is enough new connective tissue to lead to the conjecture that an inflammation was spreading from the nasal chamber in view of the more positive appearance in the previous section, but this is little too fine spun diagnosis to be very reliable, especially in view of the poor showing in the first slide.

3,4103. Internal wall of sphenoid. More conclusive of inflammatory processes, but one sees less, comparatively, of fibroblastic action and more edema or serous infiltration."

3.4113 (5 slides) March 30, 1921 (Case 31):

(a) "Right middle turbinate. Soft parts not especially altered. Some hyperplasia of fibrous tissue near the bone and a very moderate degree of increase in the cellular activity along some bone edges,—blood vessel walls somewhat thickened. *Chronic inflammation of deeper elements of the mucosa and of the bone.*

(b) "Another fragment of right middle turbinate. Thinner section—more impressed with bone involvement. Fibrous hyperplasia quite evident.

(c) "Sphenoid. Specimen very small. Rarefying osteitis along some edges rather marked, but soft parts are largely lacking—not very satisfactory.

(d) "Ethmoid. More tissue but no epithelium. Connective tissue near bone rather damaged by decalcifier, but intense nuclear infiltration and bone changes marked as in A—more of it.

"O. im. 1/12 not very satisfactory. Section thick and cellular changes not very distinct, but one gets the impression of much cellular infiltration. Rather an acute process involving bone.

(e) "Post ethmoid. Narrow long strip of bone. Nothing to add to A."

3.4118 (4 slides) April 6, 1921 (Case 32):

A. "Left middle turbinate. Not much increase of new or old connective tissue,—in glandular areas very little, but here it is gorged with leucocytes and considerable serous effusion. Deeper there is fibrous hyperplasia and thickening of the periosteal layers and I should think the bone areas show an increase in thickness. There is apparently some cellular hyperactivity along the bone edges, but the definition is poor. *Old chronic inflammation with acute exacerbation.*

B. "Another section shows rather marked subepithelial serous and leucocytic infiltration in another locality. Surface epithelium not much altered, otherwise as above.

C. "Post ethmoid. Very much more new connective tissue formation and a good deal of leucocytic infiltration with numerous lymphocytes. Bone shows up badly under high power, but I should think it at least somewhat—probably much invaded, a subacute inflammatory process more plainly evident in the soft parts.

D. "Sphenoid. Piece too small and bone unsatisfactory, but probably seat of inflammatory activity, *i.e.*, ragged edges and chromatin effusion—cellular bone changes not shown."

Dr. Harrison L. Martland, pathologist of the Newark City Hospital, also examined my sections and dictated the following:

"Most sections show intact mucosa, in many places it seems to be edematous and hyperplastic; submucosa varies all the way from normal to areas containing numerous small mononuclears, practically no polymorphonuclears, some sections show considerable number of eosinophiles indicating low grade chronic infection.

"Submucosa is often edematous, in some places there is questionable rarefying osteitis. Many sections show considerable dilatation of submucosal vessels (acute hyperemia) and undoubtedly represents low grade chronic inflammation, which is non-suppurative.

"*Conclusion.* It is quite possible in non-suppurative inflammation that edema of mucosa and submucosa with acute hyperemia of vessels, etc., may produce more pressure than a suppurative process, in which the pressure is often relieved by the breaking down of the tissues."

CASE 30. Miss R. P., aged 25, was referred by Dr. Verhoeff at the Eye and Ear Infirmary on February 18, 1921, with diagnosis of bilateral retrobulbar neuritis. History of influenza two months previously, was in bed two weeks and had considerable trouble with her head. Always subject to colds accompanied by pain in the back of the head and above the eyes. There was, however, no pain through the eyes with the above mentioned attack, but there was severe pain in the back of the head. The right eye was blurry

almost with the onset of the influenza and two days later the left eye was likewise affected. As far as the patient can tell the vision of 20/200 has remained practically unchanged since the trouble commenced. The fundi were negative except small pigment spots in the macular lutea and a striped appearance, probably not pathological. Visual field showed slight contraction. The pupil of the right eye was somewhat larger than the left. A deflection of the septum to the right posteriorly, crowded an enlarged middle turbinate and evidently blocked the posterior sinuses. The left middle turbinate was also moderately hypertrophied. The physical, neurological, Wassermann and dental examinations were negative. Dr. H. H. Vail went over the case carefully but found no evidence of any cerebral or cerebellar lesion. Dr. A. S. Macmillan made stereoscopic plates and reported that the ones under exposed showed slight haziness of the sphenoids. In the absence of other findings it was felt that the sinuses should be drained, so on February 24th, a semiradical sphenoid exenteration was performed on the right side. Smears and cultures were made from the sphenoid and numerous specimens saved for future study. The walls of the sphenoid were pinkish and somewhat thickened and suggested a recent inflammatory condition. The patient was apparently not benefited by this operation. Three weeks later she was thoroughly reinvestigated and a lumbar puncture done but the findings were practically negative. Dr. Alexander Quackenboss, who later examined the eyes, reported that there was a suggestion of an old iritis on the right, *i.e.*, a ring of deposit on the anterior capsule. He offered the suggestion that the loss of vision might be due to some focal infection, such as teeth or tonsils. The teeth appeared negative both from films and on inspection, so the tonsils which seemed somewhat enlarged, were removed, but no pus or special pathology was found. Following the lumbar puncture the patient was confined to bed for two or three weeks with very severe pain throughout the head. This pain entirely disappeared after the removal of the tonsils. Although the patient could not apparently read the chart better at the time of discharge than when she entered the Infirmary, she could, when ordered to do so by Dr. Verhoeff, read ordinary book print, so he was inclined to think there was an element of hysteria in this case.

As to whether earlier drainage of the accessory sinuses would have proven beneficial, it is impossible to state. Cases of two months' duration, as was this one, do not respond as readily as those of short standing. These cases are followed for months or even years, so it is hoped that some future developments may throw light on the etiology. The cultures from the sphenoid showed one or two colonies of staphylococcus albus. For a report on the sections taken from the middle turbinate and sphenoid see Dr. Wright's interpretation. A recent letter from the patient says that the vision remains the same, although the general health is much improved.

Case 31. Miss J. I. B., aged 27, was referred by Dr. Alexander Quackenboss on March 15, 1921, with diagnosis of optic neuritis, right. History of fair general health but was rather tired. Had double pneumonia four years ago, since which period has been subject to colds and has had one for the past four or five days. This was accompanied with pain about the eye which has increased in severity so that when seen she looked extremely ill. Eye was sensitive to light and on movements and pressure. Vision when first seen was 20/20. The right middle turbinate was somewhat enlarged and the septum bent slightly to that side. No secretion was seen within the nose but there was a marked pharyngitis with considerable tenacious mucus. Transillumination was negative. The patient was referred to the Eye and Ear Infirmary for investigation and the sinuses x-rayed by Dr. Macmillan, who reported: "Frontal sinuses undeveloped; ethmoidal region quite cellular; right slightly clouded, especially posterior group; sphenoids moderate size and wall anterior to sella appear clear; antra are both large and clear. The physical, neurological and Wassermann examinations were all negative. Films of teeth showed infection about one, which was extracted some three weeks later. On March 17th, Dr. Vail examined the patient and found the vision 20/40 with central scotoma for colors. The following day she was seen by Dr. Quackenboss, who found considerable increase in the neuritis and vision 10/100. There had been severe pain about the eye for the entire week and it was still sensitive to pressure. In view of the negative neurological examination, the rapidly diminishing sight and the increase in the inflammation of the optic nerve, it was deemed advisable to open the accessory sinuses. The patient was accordingly admitted to the infirmary and on March 18th, under general anesthesia, the right middle turbinate was removed, the sphenoid opened and the posterior ethmoid uncapped. The tissue was somewhat inflammed but no pus was seen. The lining wall of the sphenoid was little, if at all, changed. Cultures and smears were made and specimens saved for study. On the day following the operation the patient felt considerably relieved and the eye was less blurry. This lasted but a few hours, then there was a rapid recurrence of the blurring and the vision continued to fail, so that a week after operation fingers could be made out only at three inches. Dr. Quackenboss examined the eyes four days after the operation and reported edges of disc practically obliterated, some exudate; small blood vessels engorged; no

marked swelling or papilloedema; no hemorrhage. Two weeks after operation the swelling in the nose had subsided and the patient was much better; discomfort and blurriness alleviated; counted fingers at eight feet; four days later fingers at 15 feet and vision was 20/80. On April 15th Dr. Quackenboss examined the fundi and reported blurriness practically disappeared and outline of disc sharply defined. April 25th the vision was 20/60. On April 29th, Dr. Quackenboss again examined the eyes and noted slight pallor of the disc. The smear from the sphenoid showed only blood and a few epithelial and pus cells. In one of the culture tubes there were three colonies of diphtheroid bacilli. The specimens from the middle turbinate and sinuses were examined by Dr. Wright. See his report.

CASE 32. Mrs. H. G., aged 24, referred by Dr. H. B. C. Riemer at the Infirmary on March 16, 1921, with diagnosis of bilateral retrobulbar neuritis. History of frequent headaches, otherwise negative. Present Illness—Following a severe cold four weeks ago there was a sudden loss of vision in the left eye and two days later in the right. This was associated with pain on moving the eye and sensitiveness to pressure. When seen, a week or ten days ago, by Dr. Riemer, there was considerable swelling about both discs and the vision was practically the same as on admission, *i.e.*, 20/70 right and fingers at two feet left. Fundi examination showed that the edges of the discs were not entirely lost or obliterated. The lower outer edges were quite distinctly made out. Upper portions indistinct with some pallor. Slight enlargement of the fine capillaries. Physical, neurological, dental, Wassermann and spinal fluid examinations negative. The septum was badly deflected high up with enlarged middle turbinate in close contact with it. Pus above the right middle turbinate and below the left. Dr. Macmillan reported as to the x-rays: "Both frontals small and clear; left ethmoids definitely clouded, right ethmoids clear. Both antra clouded, probably thickened membrane. Teeth show no evidence of apical involvement. Teeth in good condition." Dr. Vail went over the patient neurologically and found no evidence of any cerebral or cerebellar lesions. As the eyes had not improved during the past week and there was a slight pallor noticeable, it seemed urgent that the infection should be relieved, so on March 23d, under general anesthesia, a submucous resection of the septum and a bilateral semi-radical sphenoid operation were performed. The sphenoidal mucosa appeared practically normal. Smears and cultures were taken and specimens sent to the laboratory for study. The smears were chiefly blood. Five cultures from the sphenoid showed one to three colonies each of staphylococcus albus. No pus was seen during the operation. Patient improved rapidly, so that when discharged a week after the operation, the vision was 20/70 left and 20/40 right. On April 29th the fundi were examined and the edges of the discs were found to be sharply defined but there was slight pallor of the entire discs. Vision without correction 20/30 both. See Dr. Wright's report on specimens removed from turbinates and sinuses.

CASE 33. N. C., aged 24, was referred by Dr. Verhoeff at the Infirmary on April 29, 1921, with acute unilateral retrobulbar neuritis. Patient in good general health. Has had several operations on nose and throat. Tonsils were removed last November and septum resected (?) last January. Has had considerable secretion in throat and blowing of nose. No recent cold. On April 10th, on awaking he noticed that things seemed blurry when viewed by left eye. This grew rapidly worse so that in two days he did not even have light perception. Four days later, the vision returned somewhat, so that he could count fingers at five or six feet, but since that time it has been stationary. Dr. Verhoeff on examination noticed distinct pallor of the left disc. Eye sensitive when moved up or sideways, and there is a sense of discomfort back of eye. There was a moderately high posterior deviation of the septum to the left, which was in contact with a hypertrophied middle turbinate. There appeared to be considerable obstruction to the drainage of the posterior sinuses on the left. No secretion was seen. Transillumination negative. Naso-pharynx showed marked reddening with thickened glandular areas scattered over it. Medical, neurological and Wassermann examinations negative. Visual fields showed a marked central scotoma and some contraction. Massachusetts General Hospital reported that there was no other cranial nerve involvement. Dr. Vail ruled out cerebral or cerebellar lesions. Dr. Macmillan reported on x-ray of the sinuses as follows: "Posterior ethmoids both sides are definitely clouded, sphenoid does not appear to be quite normal. Antra and frontals do not appear to be affected. Teeth—Abscess about roots of right lower second molar." On May 3d, the patient was operated upon. It was found that the upper posterior portion of the septum which appeared twisted had not been resected. This was accordingly done by Dr. Vail. The resection extended back to the front wall of the sphenoid as it was otherwise difficult to obtain a good view of that region. The middle turbinate was removed. The front wall of the sphenoid was broken down, and the posterior ethmoid cell uncapped. Various sections of the sphenoid and posterior ethmoid were preserved for study. Smears and cultures were made, one on liquid blood serum in an endeavor to grow the streptococcus viridans. The lining membrane of the sphenoid appeared normal. No pus was seen. Within 48 hours the discomfort about the eye and sensitiveness to pressure had entirely disappeared. Fogginess less dense. Not very

marked reaction from operation. Vision fingers at 12 feet. Two days later patient had a temperature of 103 and the lateral wall of the throat showed some redness. This was followed late in the afternoon by a severe hemorrhage from the left side of the nose which was not controlled until the posterior nares and nose were firmly packed for 24 hours. Two days later the patient developed acute middle ears and it was necessary to incise both drum membranes. The slight infection in the nose subsided rapidly and although it was necessary to reincise both drum membranes, the patient went along favorably.

Cultures from the sphenoid showed two colonies of staphylococcus albus on solid media. A few short chains of streptococcus in water of condensation in addition to abundant staphylococcus in blood serum. The patient is still under observation. On May 31, 1921, fingers could be made out at 20 feet.

SUMMARY.

Etiology.

Earlier writers considered the anatomical relations of the optic nerve to the accessory sinuses the chief factor. Later ones claimed the trouble was transmitted by the soft tissue. No one etiological condition is responsible for all cases. Purulent infection accounts for a few, while hyperplasia seems of minor importance. The size and position of the middle and superior turbinates probably explain the etiology in a large number. Poor ventilation and faulty drainage are all important predisposing factors.

Pathology.

Subdivided into four parts:

1st Direct extension.
2nd: Toxemia.
3rd: Bacteremia.
4th: Hyperplasia.

1st: By direct extension acute infections in the adjacent sinuses spread by continuity of structure to the sheath of the nerve, or even to the optic nerve itself, while in the more remote sinuses the infection becomes walled off. Nature has also walled off the chronic infections so that it is futile to longer believe purulent sinus disease the one and only etiological factor. Cases with sudden loss of vision presenting such noses might better arouse suspicion that the cause should be sought elsewhere than longer be considered the *sine qua non* of accessory sinus blindness.

Similarity between optic neuritis and Bell's palsy.

2nd: Toxemia. Toxins originating in the accessory sinuses or elsewhere may involve the optic nerve.

3rd: Bacteremia or focal infection. Microorganisms may be carried in the blood stream or lymph channels from the foci of infection in the sinuses to the regions adjacent to the optic nerve. Hematogenous focal infection of the nervous apparatus has been demonstrated, so why not a similar involvement of the optic nerve?

4th: Hyperplasia. Probably as a predisposing factor of considerable importance, but not *per se*. Hyperplasia, plus infection and direct extension to the optic nerve is responsible for many cases.

Cultures when taken all gave some growth, principally the staphylococcus albus. A few streptococci were found but the viridans were not isolated. Several of the sections showed considerable increase in the leukocytes and fibroblastic tissue along the margins of the bone. Others showed chronic inflammation of the deeper elements of the mucosa and of the bone, while a few showed fibrous hyperplasia.

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MODERN METHODS IN THE TREATMENT OF FRACTURES.

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In approaching the subject of the treatment of fractures, I am mindful of the fact that there still prevails among surgeons, and especially orthopædic surgeons, a wide disagreement as to the proper procedure to be followed, and yet, in its final analysis, what we all try to accomplish, is and should be proper function.

Royal Whitman aptly expresses it when he

says, "The purpose of the treatment of a fracture is to restore function. For this the essentials are correction of the deformity, fixation of the fragments until security is assured, supplemented by protection during the period of reconstruction."

It may seem presumptuous in me to say that there is a lack of appreciation of the mechanical principles, underlying most of the methods employed in the reduction of broken bones. Illustrations of this, you and I have seen in our every day practice; where the poor apposition of fragments has resulted in deformity, and lastly, but most important, bad function to the part. The mistakes and poor results of fractures are never forgotten; they live on, the unrelenting witnesses of poor workmanship.

Today, with a proper conception of the position of the fragments by the use of the x-rays, a better appreciation of the deformity existing, a clearer understanding of the musculature surrounding the fragments, it seems as if we ought to obtain better results. Recognition of the deformity and recognition of the displacement of the fragments, are to my mind, the all important factors, because once they are determined, certain well known mechanical principles may be applied, and the reduction of fractures in the majority of cases ought to be an easy matter.

It is hardly necessary for me to say that there are certain types of solution of bone which do not admit of good reduction, open or closed, and hence, the results procured are the best results obtainable under the circumstances.

In my brief experience of eleven years at reducing fractures, I am firmly convinced that accuracy of apposition should be more efficient than it is today. In attempting to obtain accurate apposition, you may criticize me for what may seem to be a rather radical point of view, if I say, that the open reduction of a great many fractures, under strict aseptic procedure, promises to the individual a better end-result, than some cases of manipulation.

I do not mean to say that all fractures should be reduced by the open method. There are certain fractures such as fracture of the humerus at the elbow, fracture of the forearm, one or both bones, fractured femur shaft, fracture of the patella, and certain types of fracture around the ankle joint, which demand operative interference.

You may say that infection is a dangerous possibility. That I do not deny; but, the danger is no greater, if experience is to be considered, than one finds in an abdominal laparotomy; again I say, that it would be unwise to convey the impression that the modern treatment of fractures demands that all cases of solution of bone by violence should be treated by the open method. Good treatment presupposes a sane recognition by the x-ray of the position of the fragments as they lie in antero-postero and lateral positions, and it is further assumed that the diagnosis of a given case entails upon the diagnostician, a keen sense of appreciation of the status of the fracture in question, whether manipulation in a given case will reduce and give a result compatible with good function or whether expediency demands that the open procedure be adopted as the first method.

To illustrate: Take a fracture of the lower end of the humerus, through one or both condyles, with marked displacement of the lower fragment, there is more laceration and more damage inflicted on the tissues in this type of fracture by the closed method with a doubtful reduction, than there is by making a small incision over the outer aspect of the arm, separating the muscles by blunt dissection and exposing the fragments to accomplish proper apposition, with a sure end-result. Again, there are cases such as fractured femurs along the line of the shaft.

Most of you can recall a case in which you have had to offer an embarrassing explanation to the patient or relative, that the leg was apt to be short because of the possibility that you would not be able to approximate in good alignment, the fragment. Can you not recall the uneasiness with which you approached the patient or relative after failure upon your part by traction, to get the fragment in good alignment? You again went into a detailed explanation as to the end-result with a consequent shortening due to overriding. Why is it not better in the beginning, or when the case is presented for your care, to state positively and plainly the inaccuracies and doubtful procedure entailed in the closed reduction, and then to submit that an open reduction under the circumstances, in the case of the fracture of the femur, is a surer proposition, when the question of deformity, length of leg and of course, the function of the individual part, is in question. Such an explanation, put forth in a straightforward way, would command, and has commanded in my experience, the consideration it deserves, providing, the uncertainty of the other reduction is explained in a clear way to the patient or to his relatives. However, voicing as I do, the operative procedure in cases of fracture of the shaft of the femur, I want to take issue with those surgeons who say that in fractures of the neck of the femur, operative interference is demanded.

I am not in sympathy with any operative procedure of any bone fracture where the experience of others, and my own experience, teaches that the closed method is the best procedure. I refer especially to fractures of the neck of the femur, intracapsular or extracapsular. Of all fractures, I believe the most discouraging results have been obtained in fractures of the hip-joint. The shortening and deformity with the resulting poor function,

has been a reflection, to my mind, upon the treatment of this condition; and yet, it is fair to assume that a proper understanding of the fracture in question, the pathology, as it were, would change to a great degree some of the unfortunate happenings in these cases. "It is a sad mistake," as Whitman puts it, "that the conventional treatment is conducted with a pretence of surgical efficiency requiring constant and skilled attention, much of which is expended on the care and treatment of bed sores." Of course, we understand by this very piercing and incisive statement that he means the traction method.

Traction is not efficient for fractures of the projecting neck, because the best it can do is to approximate the fragments in a lateral and consequent insecure relation, and the quality of fixation which is just as essential in these fractured hips as in other bones, cannot be maintained. In fractured hips there is always on diagnosis, a short leg, eversion of the foot, tenderness, and pain on motion of the part. In the pathology we find the inner part of the neck rotated backward, and the external part rotated outward. The alignment, instead of being on the angle of 135 degrees in a fractured neck of the femur, is about a right angle, hence, with this pathology, we must not only get traction, internal rotation, but lastly, and above all, abduction. The abduction treatment is in absolute contrast to the conventional method, yet it is based on adequate mechanics. You will doubtless agree, that considering the results that have been obtained in fractures of the neck of the femur, the abduction method offers to the individual with a fractured hip, a better result than the traction or conventional treatment. You are all, perhaps, familiar with the technique of the abduction method; allow me, if you will, to refresh your minds at this point by giving you the technique of reducing a hip as outlined by Whitman himself.

"The patient having been anæsthetized is placed on a pelvic support with a perineal bar, the shoulders resting on a box of equal height. Two assistants make manual traction on the extended limbs, drawing the perineum firmly against the bar and reducing the shortening on the injured side, as demonstrated by measurement; the surgeon meanwhile lifting the thigh upward, if it is below the plane of its fellow. The limb is then rotated slightly inward, thus completely apposing the fragments. Both limbs, extended and under manual traction, are then abducted to the full limit, on the sound side first, to demonstrate the normal range and to balance the pelvis. When the limit is approached on the injured side, tension on the capsule aligns the fragments in a horizontal plane, and the inner or head fragment, fixed by the acetabulum, finally forces the neck fragment against it. This mutual pressure is the first essential of stability, and it is further assured (in central fractures) by the inclusion of the line of fracture beneath the acetabular rim, by the apposition of the trochanter and the side of the pelvis, and finally by the absolute muscular impotence incidental to complete abduction. A long plaster spica is then applied, which by fixing the limb in complete abduction, full extension, and slight inward rotation, insures the continued effectiveness of the anatomical splinting. If the fracture is incomplete or impacted, the neck in its relation to the shaft is usually displaced backward and downward, and whenever the deformity is sufficient to seriously impair the normal range of motion, it should be corrected."

The writer here wishes to say that lately he has been reducing these hips upon one of the traction orthopædic tables now being used. In the use of this table the procedure outlined above is simplified to a great extent.

The method of Whitman in fractures of the neck of the femur offers to the individual a better chance as to function and life. It is certainly a far better treatment to get a patient up on his feet in about three or four weeks than to have him on traction three or four months. What is said of the neck of the femur may well be said of fractures of the radius, distal portion, sometimes called Colles' fracture. The type of deformity usually seen is bulging of the wrist at the styloid process of the ulnar, and this occurs chiefly because the displacement has not been recognized, or, if recognized, has not been reduced to its proper position and alignment. Of all examples of fracture in the immediate vicinity of joints, this type frequently presents a backward displacement of the lower fragment of the radius. In the recognition of the displacement and deformity, reduction of the same is easily accomplished, whether impacted or not, by the following method, which I have found of great value. If the fracture in question is one with the displacement just described, the duty of the operator is to palpate the fragments, noting well the displacement of the lower end of the radius. This is very easily done by running thumb or forefinger along the posterior aspect of the forearm to the distal end of the radius, a distinct ridge will be felt at this point of the fracture, because the ridge is so prominent that it cannot escape detection. With the assistant holding the upper forearm, traction of the fractured arm should be made. When the traction is taut, the loose fragment will be easily discernible. It is then the proper time to push forward and downward with your thumb the distal fragment, and at the same time flex the wrist and give it a slight ulnar deflexion; always keeping in mind the necessity of pressing downward. To prove clinically that your fragment is in position, the following scheme may be employed: starting at the

distal end of the radius, run your thumb lightly along the shaft towards the elbow. If your fracture is reduced, the ridge which you found on diagnosis will have disappeared, so that there is a continuity of bone as before. This detailed description of the reduction of Colles' fracture may seem of little importance, common as it is in our every day practice, yet, I have witnessed some poor reductions, or non-reductions, as the case may be. In this type of fracture the fault lies not so much in the recognition of the displacement as it does in the fact that the method of reduction has been inefficient. I say this, not in the spirit of criticism, but it is just as true of Colles' as it is of all fractures, unless the mechanical status is understood, reduction is impossible. There may be some criticism of the fact that the hand is flexed for the period of 10 to 14 days, and some orthopædic surgeons may insist that a flexed position, left for any length of time, such as I have described, tends to produce a contracture at the anterior surface of the arm, which is very resistant to treatment, when the cast is removed. In answer to that may I say that I agree to a great extent with those who contend that in the reconstruction of a fractured bone, massage, baking, and manipulation be started early. It is my practice, in fractures of the wrist, to remove the cast in 10 days, bring the hand from the flexed attitude to an extended position and start massage, baking and manipulations; meanwhile, the part is protected by an anterior wooden splint. True, there is some danger in the removal of the cast at this time, but if the care of the arm during the period of massage is efficiently supervised, there can be no difficulty from early removal. The anterior splint is retained in position until the end of the third week from the time of reduction. A good result from a fractured wrist sends the patient back to his occupation satisfied. On the other hand, send him back to his work with a poor result from a wrist fracture, and he, his family, and his employer will avoid your office in the future.

I have described some of the common methods of reduction in which the closed method has brought excellent results. However, there are some cases that demand, for accuracy of position what might be called open reduction. Under this classification would fall fractures or the shaft of the femur. I have mentioned this casually in the earlier part of this paper, but from my experience, I now make it a rule to operate all fractured femurs along the line of the shaft as far as the knee-joint, by the open method, without attempting any manipulation or traction. This opinion may be sometimes changed when applied to children very young or, possibly, under the age of 10 years, because the results here, with ether manipulation, are generally satisfactory. In some cases, however, where the approximation is not good, I feel justified in operating on a case over five years of age.

The results obtained in all operative cases of the femur have been exceptionally good from a functional standpoint; there is excellent union, no shortening, and good motion at the knee-joint. Just a word as to the technique employed for open reduction of the femur. If it is my good fortune to see a case upon its arrival at the hospital, the patient is placed at once on a bed with a fracture board underneath the mattress. The traction apparatus with 15, 25, 30 pounds is applied to the part. The foot of the bed is elevated, sandbags and coaption splints serving meanwhile to keep the fragments in good position. The patient or his family is advised of the treatment. The preparation consists of carefully shaving the leg, thoroughly cleansing with green soap and water, followed by alcohol and ether. The leg is carefully wrapped in a sterile bandage or towel and the patient is kept on traction until he is sent to the operating room, which is usually the following morning. When the patient is fully anesthetized, he is transferred to the traction table which I use for such cases. Both legs are fastened by the feet to the traction, the leg is prepared for operation by the application of iodine, the iodine being applied to the entire thigh, back and front, from the groin to the knee. Incision is made along the anterior outer aspect of the thigh, the knife used in this incision being put aside, not to be used again. The wound is cleansed with sterilizing solution, consisting principally of alcohol; wound towels are applied by clips in such a way as to leave no part of the skin exposed, the operator working down through the incision entirely free from any contamination of the skin; the fascia is cut with the scissors, exposing to view the large muscles of the thigh, these are carefully dissected, blunt dissection, for most part, either by the finger or blunt periosteal elevator, the fragments are quickly exposed, and the apposition and character quickly noted. Very often in types of fracture of the femur, the transverse type, there are serrations which approximate very readily. At other times the character of the fracture may be such as to demand upon the part of the operator, a quick decision as to the method to be employed, and this brings me to the question of the use of foreign material or foreign bodies for the apposition of fractured bones. You will, perhaps, recall the practice of using wire, steel, silver or other contrivances which have been and are being used to some extent by different surgeons.

Mr. Arbuthnot Lane of London, had wonderful success in the use of the celebrated Lane plates for fractures. There can be no doubt that Mr. Lane's technique was such that his results were excellent. The experience of most men, to the contrary, in the use of these plates

has not been at all convincing in the matter of obtaining satisfactory results. We all know that suppuration, in some cases, has been severe, but while Mr. Lane, in the use of these plates, has been very successful, their promiscuous use has led to very bad results. This is not only true of Mr. Lane's plates, but it is true of a great deal of the foreign material that has been introduced into the tissues for the repair of fractures. Brief perusal of the literature of today will demonstrate that less foreign material is being used now than ever before, and it is gratifying for me to say that I am able to operate upon most cases of fractured bones, and to maintain fixation without introducing any material which is not absorbable. Let me venture a broad statement based upon my own experience. I have yet to find a case which cannot be held as firm and well, if it must be held with kangaroo or chromic cat-gut. The cast and protective measures for holding the fragments in position, together with the large powerful muscles which go along the arms and legs help at the same time to maintain fixation. In the cases which I have seen where the foreign material has been used, silver wire or plates have been a strong factor in preventing union. This I know to be the case in fractures of the tibia and fractures of the femur. May I complete this part of the discussion by saying that I object very strongly to the use of foreign material in the reduction of fractured bones.

The status of the individual with the fracture, as far as the general bodily health is concerned, is another vital factor. It believe it is good practice to determine immediately upon the assumption of the care of an individual case, whether he or she, is in good physical health. There are many factors that enter into the rapid convalescence of the patient; hence a complete physical examination on entrance to the hospital is absolutely necessary. This should include a white count, Wassermann, Von Pirquet skin test as well as urinalysis and chest examination. We all know that specific disease is an underlying factor many times in nonunion; it is also a factor in the convalescence of a case where the individual may have excellent position as regards fragments and good union, but still complain of pain in the region of the injury. X-rays may reveal a periostitis or it may not, nevertheless, I have found that when salvarsan was administered in conjunction with mercury and iodine, the condition was rapidly cleared up and the function of the part became normal. I now make it routine to examine the blood and if Wassermann report is positive, to proceed immediately with the anti-luetic treatment.

Another point that I wish to emphasize in this respect is the liberal use of the x-rays. When doubt exists as to the character or presence of a fracture, safety first is a good axiom to follow. I need not express to you the surprises I have experienced at various times when I have used the x-ray as a sort of checking up process, to find a fracture in what I thought on clinical examination was nothing but a mere contusion. I mention these details because of the fact that although they seem of minor importance, yet in the long analysis, are of the greatest importance to the patient and doctor.

I have spoken casually of fractures of the humerus with displacement at the elbow joint. I have also spoken somewhat of the character of the operation to be employed. I might say that the same technique that I have described for fractures of the shaft of the femur applies very well to this type of fracture. I need not tell you because you already know how important a fracture of the elbow is from the standpoint of the patient and physician. How many malpractice suits have arisen because of the poor function resulting from the poor apposition of the fragments. Some time ago, especially when I was a student, the axiomatic expression with which you are familiar, "Always put the arm in acute flexion," is good enough as a general principle, but experience has taught me in most cases of the elbow-joint, that something more than acute flexion is necessary for the proper reduction of an elbow, and it has also been my experience to find that acute flexion will sometimes produce deformity, provided that is the only procedure followed. I do not want you to gather the impression that acute flexion is not the proper procedure in a great many cases, where there is no displacement of the fragments; but if the displacement is unrecognized and the arm put in acute flexion, without the reduction of the displacement, limitation of motion is very likely to result because of the excessive callus arising as a result of poor apposition. Having had considerable experience with elbows, I believe that in the majority of cases where there is displacement, open reduction is the procedure to be followed.

Open reduction of fractures of the patella has become so common that it is probably unnecessary for me to dwell at length upon the type of operation desired, and yet in looking over some of the end-results, I find that there is still a tendency upon the part of some men to use foreign material such as silver wire, in fractures of this kind. I have voiced in another part of this paper my objection to the use of foreign material on the ground that it prevents union and causes suppuration. I think this is just as true of the patella as any other bone in the economy. In the technique of the operation employed, it is the practice of some men simply to unite the capsule and tendon around the two fragments, by a purse string suture of kangaroo or chromic cat-gut and to appose the fragments in this way. Personally, I have no objection to this process, excepting,

I believe, that a firmer apposition is acquired when the two fragments are drilled through and through on the outer and inner side, and these two holes being pierced with coarse kangaroo sutures. These kangaroo sutures are tied, bringing the fragments close together to reinforce apposition. Following this I generally purse string and tie with chromic cat-gut the capsule and tendon which has been separated by the injury. I have seen operators open the patella and irrigate with a solution of bichloride of mercury or some other weak antiseptic. I not only believe this to be unnecessary, but from a bacteriological standpoint somewhat dangerous, because of the chance of introducing foreign material into the knee-joint. I find also that the semi-circular incision for operation of the patella heals most readily.

Regarding the fractures of the lower end of the tibia on the epiphyseal line with marked displacement of the fragments, inward or outward; unless a proper reduction is obtained in this type of case the resulting deformity is bad, in that the patient usually has a very marked valgus of the foot and the deformity is so great that function is about 25% normal; if I may express it this way. The patient does not get what might be called a normal foot, and his ability to walk and to perform certain kinds of work which demand standing cannot be accomplished; hence, in this type of fracture I always insist upon open reduction, prying as I do with the periosteal elevator, the lower fragment into its proper relation and alignment to the upper fragment.

A source of very great trouble very apt to be diagnosed somewhat late is a fracture of the scaphoid of the wrist, usually occurring in the same way as a fracture of the lower end of the radius. The patient has pain and tenderness in the region of the scaphoid. In the majority of cases the x-ray is the determining factor; and it is the determining factor only when the x-ray is clear and incisive, because the bone being very small, the radiation and radiability may not be as good as in the large bones. I have made it a practice in the case of a scaphoid not to remove it until palliative treatment with the hand in the hyperextended position has proven unsuccessful, and the x-ray has confirmed the fact that nonunion still exists. I suggest operative removal en masse. In the technique of this operation I would warn those who have never attempted it that while it is a very small field for operation, the excision of a scaphoid, attached as it is to all the surrounding bones, is an operation requiring some skill. I do not mean to convey the impression that the operation is in itself a dangerous one, because it is not, but if one is to perform it and have a sure function of the part afterward, it is absolutely necessary that the dissection and removal be complete and no small pieces of bone or periosteum be left inside after the operation. The regeneration of bony tissue following the operation will result in bony spurs and bony tissue which will necessarily interfere very much with the function of the wrist-joint.

This paper would be incomplete if I did not touch upon the well-known fracture of the ankle-joint, sometimes labelled Potts' fracture, sometimes called fracture of the tibia and fibula. There have been wide variations in this type of fracture, lately I have seen it in three patients, complicated by a dislocation of the ankle. I need not go into detail here as to the method to be followed, excepting to say that the closed method usually is sufficient for reduction. It is quite important, however, to keep in mind that the deformity resulting from poor treatment is an ununited internal malleolus, with a valgus deformity of the foot. It is also well to keep in mind that the deformity in these fractures is usually of a character where the lower fragments bend inward throwing the foot forward; if you would to a great extent overcome this condition, I suggest that you manipulate early, as early as possible, using considerable traction to overcome the deflexion of the fibula gradually rotating the foot inward to get the position of the internal malleolus, bringing the foot to a right angle and dorsi-flexion, anticipating, if possible, the shortening of the Achilles, which is altogether too common an occurrence. If the dislocation is posterior, it is well to get the dorsi-flexion very marked if you would overcome the shortened Achilles after the cast has been removed.

I have spoken of the many types of fracture, those which seem to me most common in practice, and yet I would be somewhat remiss if I did not mention before closing this paper the present day treatment of compound fractures. There is only one way to treat the fracture, whether it be simple or compound, and that is to treat it immediately. The old method of allowing the swelling to subside does not seem good treatment, when after the swelling has subsided, we find that it requires extreme energy and skill to appose the fragments which are overriding, muscles and vessels having become shortened. Compound fractures should be treated immediately, not only from the standpoint of sterilization of the wound, but the proper apposition of the fragments should be accomplished at the same time the wound is sterilized. As to the technique employed in a compound fracture, an x-ray of the patient is of prime importance; following the x-ray the patient is sent to the operating room, where preparations have been made for a major operation. Supposing, for instance, that the case is a fracture of the tibia and fibula, being a compound fracture of the tibia. The patient is anesthetized and when deep anesthesia is procured 1500 units of anti-tetanic serum is administered;

the injured part is scrubbed with green soap from the knee to the toes, including the wound. This is followed by alcohol and ether. After the ether has evaporated, a coat of iodine is applied. A second swab is used to apply the iodine over the wound area. The leg is draped with sterile towels or sheets, the wound only being exposed. The lacerated parts of the skin and muscles are cut away, and iodine (Churchill's tincture) is swabbed carefully into the wound. The solution of bone is located by careful manipulation and without enlarging the wound to any extent, periosteal elevator is slipped down through the wound while the assistant makes traction on the leg, the ends are approximated slowly but carefully by the periosteal elevator or instrument of like character. The wound is sutured, a small wick inserted, and the cast applied. The patient is sent to the ward with a window marked over the area of the wound for cutting the next day.

On the next day the position of the fragments is confirmed by the x-ray, and in 48 hours the wound is dressed. If there is no evidence of pus, the wick is extracted and the wound allowed to heal. Compound fractures treated in this fashion do not suppurate as a rule, and in a great majority of cases it is probably possible to close the wound entirely, if one wished to do so, depending upon the nature of the injury.

If I seem to express some radical ideas in regard to the treatment of these conditons, I want you to believe that I have arrived at these conclusions after thoughtful and intensive study of these sometimes very troublesome conditions of the human body.

OVERWEIGHT IN CHILDREN.*

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Overweight in children has not received the attention from either parents or physicians that its serious menace to health warrants. It has been the custom to think of it as a hereditary condition, or one that the child would naturally outgrow. Because of the lack of complaint from the victims themselves and also the fact that overweight is not accompanied by the conspicuous physical defects that are characteristic of underweight, obesity has been viewed as a discomfort rather than a danger, and little has been done to standardize either diagnosis or treatment.

What Constitutes Overweight. The human being is a wonderful animal, equal to a great range of adjustment and adaptation. He seems to be capable of preserving a fair degree of health under conditions of great excess of fat and of remarkable leanness. It is therefore difficult to draw an exact line to separate these children from the normal. Clinical evidence, however, corroborates the experience of life insurance companies that twenty per cent. above the averages now in use may be considered the limit of normal weight, and any excess should be investigated. In certain children there is a natural tendency to excess of fatty tissue, just as in others, to bony structure or to muscular development; but when the excess passes beyond twenty per cent. we call the condition obese.

Comparison of Overweight and Underweight Children with Respect to Physical Defects. Practically every case of underweight has physical defects directly bearing on the condition, and also nervous symptoms that are easily demonstrable. Overweight has no such apparent physical defects. Its symptoms are shown in the tax put upon the heart and other vital organs by the extra burden of weight carried. From this condition come lessened powers of endurance and diminished activity. In the matter of disposition, the fat child is usually good natured and amiable.

As a result of the physical examinations of a large number of children, we have found the underweight child averages nearly six defects, while the overweight child averages less than two. Cases are common in which it is impossible to find a single physical defect in the overweight child.

Table I. Comparison of Defects in Twenty-Four Overweight and Twenty-Four Underweight Children.

Kind of Defect	No. of Defects in Overweight Group	No. of Defects in Underweight Group
Obstructions to breathing	29	105
Gingivitis	0	1
Carious teeth	5	20
Alveolar abscess	1	1
Cerumen in ear	1	7
Otitis media, chronic	0	2
Phlyctenular keratitis	0	1
Eczema	0	1
Albuminuria	0	3
Vaginitis, gonorrheal	1	0
Syphilis, hereditary	0	1
Enuresis	0	1
Lateral curvature	0	2
Round shoulders	2	17
Adherent prepuce	1	2
Pediculosis	1	13
Endocarditis	2	0
Anemia	1	0
Bronchitis	1	0
Tuberculosis	1	0
Infantilism	1	9
	47	177

In this study the overweight children ranged from twenty to one hundred thirty-three per cent. above the average weight for their height, and the underweight group was made up of an equal number of unselected children ten per

* Presented in part before the New England Pediatric Society, March 7, 1921.

cent. or more underweight. It will be seen that the average number of defects for the overweight children was under two, while the average for the underweights was 7.3. What is of even more significance, only two of the first group had more than three defects, while only three of the underweights had less than six. Four of the obese children had no physical defects, and six had only one each, while twelve of the second group had eight or more each.

Danger of Overweight. Although the overweight children are especially free from defects which interfere with respiration, the extra burden put upon the lungs and circulation by their condition makes them less likely to recover from pneumonia or other acute illness. In the case of infantile paralysis obesity is a handicap which often prevents recovery. Joslin states that overweight is a predisposition to diabetes. "The overweight is at least twice and at some ages forty times as liable to the disease."[1]

The body is constantly trying to eliminate the excess food taken. What cannot be eliminated is stored as fat. The effect of this condition is a tendency, in greater or less degree, to toxemia, which results in a disinclination to physical or mental exertion, and hinders normal development. In general, it may be said that the younger the child, the less the danger from overweight.

The Cause of Overweight. The chief cause of obesity is the habitual intake of more food than is burned up. As a rule, this is the result of an appetite for foods of high caloric value, especially fats and sweets. The fat child may, however, take less food daily than is eaten by a thinner child, and yet put on weight. This is explained only in part by the greater activity of the latter. A more important factor is that such defects as are found in fat children are usually those which do not interfere with nutrition.

It is remarkable how general is the idea even among physicians that the usual cause of obesity is some abnormality of the endocrine glands. Such abnormalities do occur, but with the exception of the thyroid, are so rare that this cause may be disregarded except in large hospital clinics where such cases may be considered medical curiosities.[2] The use of thyroid extract in the treatment of obesity is a short cut attended with danger to the growing tissues and is seldom, if ever, necessary.

The Remedy for Overweight. The remedy for overweight is measured feeding. The child should be weighed, and a careful record, in calories, should be kept of his food for a week, with a second weighing to show how much fuel the body is able to consume in that period. A reduction of one-third of the daily average should then be made, which will afford an opportunity for the burning up of some of the stored tissue. If the loss in weight each week does not exceed from one-half to two pounds, depending upon the age, the child will feel better while the reduction is going on, and will show a constant increase in efficiency.

If there is no loss of weight with a reduction of one-third the amount of food usually taken, a further reduction of 100 calories per day should be made, until it is found what amount of food will bring about the desired rate of loss. The total amount may be reduced to 800 or 900 calories per day, if necessary, without causing symptoms of starvation.

The character of the food habitually taken should be changed so as to reduce or eliminate all foods of high caloric value, such as fat meats, butter, cream, candy, "made" dishes, pastry and chocolate, and to substitute in their place lean meats, fruits and vegetables, salads with little oil, bran muffins and bulky foods which will satisfy the appetite and prevent constipation.

Although successful treatment is essentially a matter of diet, physical exercise which is not overfatiguing will also assist the process of reduction. Swimming, rowing, walking and moderate exercise of any kind should be encouraged, but it is necessary to remember that many overweight children do not have sufficient strength for hard exertion, and will have to train gradually for heavier tasks.

Influence of Heredity. While the natural tendency to excess of fatty tissue in certain children must be admitted, and this often appears as a family characteristic, overweight is far more frequently caused by habit than by heredity. Many children are allowed to indulge themselves in overeating on the ground that they were born to be fat, and that nothing can save them from this condition. A similar condition in one of the child's parents may be the direct result of like habits uncorrected in youth. In our clinics we have had many cases of children believed to be destined to thinness by a resemblance to one or the other parent, who, when given special treatment and care, go beyond normal weight and actually become obese. On the other hand, the obese children who have followed the directions here given show that there is no need of their continuing to suffer from overweight. Every child should be considered as an individual, and be given all possible aid to a normal and healthy development.

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[1] E. P. Joslin: The Prevention of Diabetes Mellitus. Jour. A. M. A., Vol. lxxvi, No. 2, pp. 79-84, January 8, 1921.

[2] "In the absence of neighboring pressure signs, to say that a child who is undersized, or fat, or whose dentition or adolescence is delayed . . . is really a subject of pituitary want, is purely a matter of guess work." Harvey Cushman, M.D., Disorders of the Pituitary Gland, Jour. A. M. A., p. 1723, June 18, 1921.

HYPEREMOTIVITY: ITS CAUSES: THEIR PERMANENT REMOVAL.

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Emotivity is a state of feeling. This state of feeling or reaction to a particular stimulus, may be perceived in the lowest forms of animal life. Emotion, therefore, is not merely a function of higher psychic perception or a critical process. It is a function of the whole organism.

In answer to the question as to what is morbid and what is not morbid in emotivity, it is not possible to draw hard and fast lines, for that degree of emotivity which may be regarded as normal at one time may under other circumstances be considered differently; as, for instance, in the case of soldiers who were able to conquer by will and discipline emotions aroused by the many terrifying situations during the war—situations which at first were thought intolerable by the average individual.

The question at once comes to mind, however, as to why some soldiers can learn to face such situations with equanimity while others cannot. There are three reasons.

In some persons there occurs an unreasonable responsiveness to mild stimuli because of toxic influence or physical deficiency of the neuron; in other words, the emotional perturbations are of chemical genesis.

A second type of individuals seems to have an inherent constitutional emotivity but it is questioned whether or not the hereditary element is so important as is sometimes supposed. Upon investigation many of these persons may be found to belong to the third category.

In the third type occurs the emotivity which is induced. In the experience of the writer this type is by far the most common. The emotional state of such an individual is not of chemical origin but is of the physiological kind called psychogenetic. A person previously normal has met with a circumstance or series of circumstances which have aroused in him a powerful emotion which he is unable to overcome. For example, a case may be cited of a boy of eight who suffered from hallucinations when alone, a state of emotivity which had been induced by an over-anxious mother, alarmed whenever he was out of her sight. He only needed to be convinced that his fear that something dreadful would happen to a small boy unprotected by adults, and the imaginary dangers which he fancied would exist under such circumstances were entirely without foundation. (See "Management of Exceptional Children," *New York Medical Journal*, January 21, 1916, etc.)

A second case is that of a woman who suffered distressing symptoms whenever she found herself either in a closely confined or a very open space. These feelings she considered to be signs of illness, and it was only after continued questioning and introspection that they were found to have arisen from the powerful suggestion of the memory of a particular experience which had occurred eight years before. A cure followed after she had obtained an understanding of the mechanism of these feelings and the knowledge that her symptoms were caused by fear, *traced to a particular incident or series of incidents which had caused that fear.* (See "Phobias and Obsessions," *Internat. Clinics*, 1919, Vol. IXI.

In this case, a chronic state of emotivity and indeed an apparent pantophobia was in process of development, but when properly investigated was found to be a particular individual phobia of a definite siuation, the clarification of which enabled the patient to rid herself of the morbidity.

Therefore, in such cases the emotivity is induced. The individual has received a stimulus which created a distressing reaction. He fails to understand the true nature of the stimulus, or obtains a false view, concerning it, and the recollection of that stimulus causes a continued reproduction of the same emotions.

In proof of this a case may be adduced of a woman who having once been aroused on a particular occasion to an extreme state of emotivtivity, thereafter avoided any matter which would affect those same sensitized receptors, because she knew that the same state of panic might be thus aroused. When assured that what she feared, namely, that she might die in a panic, could not possibly happen, she ceased to avoid the situations which had aroused the panics.

Another patient believed that his intense emotivity was inherited, but upon penetration it was found to be dependent on a definite series of incidents which had induced his fears. (See *Jour. Abnorm. Psychology*, 1911.)

The methods of cure, therefore, must be those which are adapted to the particular patient where emotivity is regarded as morbid.

The true genesis of the emotivity must first be found.

In none of these instances was the origin of the emotivity a repressed, or unconscious, memory. Of course the patient was not aware of the exact mechanism until it was illustrated, and the willingness to face the situation had to be learned; but this is very far from invoking "the unconscious" of some psycho-pathologists. In no case were the dreams analyzed, and in no case were sexual factors to be incriminated. Furthermore, the readjustment was effected with comparative rapidity, in no instance requiring over two weeks. Again, in all cases the readjustment has been retained. I have never

known of a relapse of the psychoneurotic who has been properly readjusted.

The details are more fully set forth in my address to the Medico-Psychological Association of Great Britain and Ireland, in 1920, now published in the *Journal of Mental Science*, April, 1921, and in the *Medical Record*, March 7, 1920. The genesis of some phobias is still more fully considered in the *International Clinics* of 1919, Vol. 3, while the kind of obsession which leads to occupational dyskinesia, primarily "writing cramp," was very fully studied in 1912, *Jour. f. Neurologe u. Psychiatrie* of Leipsic, and in two short communications to the Neurological Society of Paris, published in *La Nouvelle Iconographie de la Salpetrière*, 1914.

MOTIVES AND EMOTIONS.

By Wolfert G. Webber, M.D., Boston.

As a result of practical experience, the writer submits the following conclusions as to the much discussed subject of psycho analysis.

1. That by instructing the patient in the true nature of his motives and emotions it is possible, in some cases, to enable him to (a) escape from self-deception, (b) to unearth his own buried complexes, and (c) to effect a re-synthesis of the dissociated unconscious psyche.

2. The psychoneuroses and dreams are of the same essential nature,—that is, the expression of disguised wishes or desires (sometimes reversed) combined with a partial dissociation of the unconscious psyche.

3. That in cases of mild or incipient psychoneurosis, it is unnecessary to have recourse to such methods as free-association, word-association, dream-analysis, or hypnotism.

Instruction of the patient follows this outline (below):

A. That the instincts are the fundamental desires which act as the motive-power of life. The instincts are unmoral. They only become moral (or social) through deference to the social taboos,— that is, to custom and the opinion of others. The instincts can be enumerated as follows:

1. The desire for continued existence (or self-preservation).

2. The desire to feel and express superiority. (This instinct is responsible for social ambition as well as for the desire for money and sex-expression.)

3. The desire to trust (religious instinct and love instinct).

4. The desire for knowledge (curiosity).

5. The desire for beauty (aesthetic or artistic instinct).

6. The desire to escape from reality (play instinct).

7. The desire to build and create (creative instinct).

B. That an emotion is an impulse to action, derived from an instinct. The instinct involved is usually stimulated by a sensation. For example: Hunger, fear, joy, and grief, are the sensations of physical conditions. They produce emotions by the stimulation of one or more of the instincts. Anger, hatred, envy, and jealousy are produced by fear (sensation) stimulating the instinct for superiority.

C. That an emotion arising from an instinct is often repressed as "immoral" or "selfish" (in deference to an ideal) and reappears in a disguised form, sometimes as the *opposite* impulse (Censorship).

D. That human life consists essentially of the constant effort to maintain a sense of superiority in the face of disappointment, disillusionment and failure.

E. That nearly all forms of human activity are consciously or unconsciously directed toward the welfare of present or future *children*. The spiritual development of the adult is only a secondary consideration.

Book Review.

A Text-book of Medical Jurisprudence and Toxicology. By John Glaister, M.D., D.P.H. (Camb.) F.R.S.E. Fourth Edition. 902 pp; 137 Illustrations and One Colored Plate. New York: Wm. Wood & Co. Price $7.50.

Professor Glaister (Professor of Forensic Medicine and Public Health in the University of Glasgow) has given in the fourth edition of his *Medical Jurisprudence and Toxicology* a thorough and scholarly exposition of the subject. The first chapters deal with general considerations, such as medical evidence and professional secrecy. Identification of the dead, medico-legal forms of death, examination of blood stains, medico-legal relation of sexual functions, infanticide, rape, lunacy law procedure; hypnotism and inebriety are among the subjects treated. The final third in the book deals with toxicology.

This is a book which, aside from its general interest, contains suggestions of value for every medical man. It is most interestingly presented, as the author illustrates his text with numerous case histories, many of them from his own experience as Senior Medico-legal Examiner for Glasgow and Lanarkshire.

The legal aspects of the book are based upon English procedure, but except in minor details this is probably not much different from that which is followed in this country.

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THE COUNCIL MEETING OF OCTOBER 5.

THIS meeting was attended by a large number of the representatives of the district societies, and a great volume of business considered. The session was one of the longest in the history of the Society. After the records of the preceding meeting had been read, the President addressed the Council and asked for coöperation in dealing with the intricate problems before the Society. He called attention to the plans for joint meetings which, if carried out, would tend to consolidate effort and promote harmony. The serious work of legislation in the interest of the state was especially emphasized and a tribute paid to previous committees. He paid a merited tribute to the memory of Dr. William J. Gallivan, who had served the state loyally and most acceptably. The full report will be published as compiled by the Secretary and only a few of the more important subjects referred to here.

The first matter of business was the selection of the orator, made necessary by the resignation of Dr. Colt, who was elected at the annual meeting. The nominating committee brought in the name of Dr. Kendall Emerson of Worcester, and he was duly elected as orator for the annual meeting next June.

The Committee on Membership and Finance gave a history of the attitude of the Society toward the payment of traveling expenses of committees, showing that it was variable, but recommended reimbursement of such expenses whenever a member of a committee was willing to accept it. The report was accepted.

The question of the annual dinner brought out the usual arguments for and against the noon hour, but it was finally voted by a considerable majority to have the dinner, next June, in the evening.

This is one of the subjects which causes a certain amount of dissatisfaction, for it is perfectly well known that many physicians in the remote parts of the state cannot very well leave some patients over night and, in addition, the expense of being away or the discomfort of night travel deter some from the evening dinner.

On the other hand, it is quite well recognized that the impressions made by speakers who are more willing to attend an evening session, may in some instances tend to demonstrate the standing of the Society and extend its influence, for although the Society has always been favored in the attendance of eminent men, Presidents have often had to devote a great deal of time in securing acceptable speakers who could give the time at noon.

Perhaps we may eventually come to a compromise by arranging for noon dinners on alternate years, for the feeling that the eastern part of the state may not fully consider the needs of the remote districts should be given due consideration even at the expense of attendance. The argument that very large numbers formerly attended the noon dinners may not apply now, for social customs have changed, and one may feel skeptical in the absence of a demonstration of the probability of ever having fifteen hundred in attendance at any future dinner.

The question of exhibits was left to the Committee of Arrangements with the addition of the President, Secretary and Chairman of the Committee on Membership and Finance.

Dr. Reynolds, reporting for the Committee on Cancer, spoke of the coming cancer week, and after telling of the ravages of the disease, expressed the fear that physicians were not uniformly efficient in advising patients with this disease as to the effective measures which may be employed.

A resolution was passed instructing the President to notify the officers of the District Societies of the Council's approval of the campaign now on.

The reports of delegates to the various congresses were interesting and was a demonstration of the activities of the Society. It is hoped that some of our members who now feel dissatisfied with Society affairs will read these interesting reports and be convinced that real work is being done by many of our members.

Dr. E. W. Taylor reported for his committee that Dr. Elliott Proctor Joslin had been

secured as Shattuck Lecturer for the annual meeting.

Dr. Robert M. Green reported for the Committee on the Dr. Samuel Fuller Memorial, and offered several suggestions relating to different methods by which the memory of this early physician may be perpetuated. The details of these recommendations should appeal to every one interested in the early medical history of the country and the further consideration of the recommendations by the Committee on Finance will be awaited with interest.

The Committee on Maternity and Infant Welfare reported a plan for further study of individual cases, and the plan was endorsed by adoption of the report. The addenda report submitted by a minority was also accepted.

Dr. Quessy of Worcester North, presented a series of resolutions tending to relieve physicians of the stigma incident to the dispensing of alcoholic beverages. These were referred to the Committee on Finance.

The Council gave some attention to the two plans providing for indemnity insurance and voted to refer the matter to a committee which will report at the adjourned meeting the second Wednesday of November next.

The session lasted nearly three hours and every matter presented was given close attention.

OBJECTIONABLE NEWS ITEMS.

ONE of the most improbable methods of diagnosis and treatment of disease has been given a very startling and somewhat long description in a prominent Boston daily paper.

A picture represents a doctor to whom the instrument used in detecting disease is applied as an illustration. The statement sets forth that "disease can be detected by a wireless electrical machine and successfully treated with enemy vibrations projected by another machine."

The theory is that electrical vibrations are opposed to those which cause some particular disease and the claim is made that the "cure of disease can be reduced to a mathematical certainty."

The diagnosis and treatment are based on the "electronic theory of disease." In a so-called condenser, a spot of blood is placed on blotting paper or it may be a piece of diseased tissue. "Radio activity passes from the condenser from the blood or the tissue and then to the forehead of a healthy man and then through the reflexophone . . . . This measures the potentiality of the disease in ohms." It is explained that the exact nature of the disease is determined after the first machine has been placed in action, by the operator tapping the subject's abdominal regions with his fingers. The sounds have to be interpreted by the trained observer.

If this was an advertisement, paid for as such, there might be some excuse for this obviously fanciful description and statement. For a reputable and dignified paper to publish matter of this character is reprehensible and one wonders whether ethical sense is submerged in a desire to print sensational claims.

While one may concede that some electrical phenomena are not comprehended, it is too late to throw away demonstrated pathological facts and exploit as scientific such jargon as has been published in this article.

One may also concede that plethora of the pocketbook may be reduced after one has been in the hands of the owner of this machine. The only mathematical certainty is the amount of money the victim is willing to part with.

ALVARENGA PRIZE OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA.

THE College of Physicians of Philadelphia, announces that the next award of the Alvarenga Prize, being the income for one year of the bequest of the late Señor Alvarenga, and amounting to about three hundred dollars, will be made on July 14, 1922, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered.

Essays intended for competition may be upon any subject in medicine, but cannot have been published. They must be typewritten, and if written in a language other than English should be accompanied by an English translation, and must be received by the Secretary of the College on or before May 1, 1922.

Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper and within the name and address of the author.

It is the condition of competition that the successful essay or a copy of it shall remain in possession of the College; other essays will be returned upon application within three months after the award.

The Alvarenga Prize for 1921 has been awarded to Dr. John W. Churchman, New York City, for his essay entitled: "Selective Bacteriostasis of Gentian Violet."

JOHN H. GIRVIN, *Secretary.*
19 South 22nd Street.
Philadelphia, Pa., U. S. A.

AMERICAN PUBLIC HEALTH ASSOCIATION HEALTH INSTITUTE.

ONE of the most important features of the fiftieth annual meeting of the American Public Health Association is to be the Health Institute which is to be a comprehensive course on public health procedure, given November

8-12, 1921. This Institute is not confined to members of the American Public Health Association, but is open to all public health workers.

The Section on Communicable Diseases will include the venereal diseases. The program includes New Jersey State Board's Venereal Conference in Jersey City on Thursday, November 10, on the diagnosis, treatment, and control of venereal diseases at the Jersey City Hospital, and the inspection of the Genitourinary Clinic and a discussion of the relation of the Bureau of V. D. Control to the practicing physician. Round Table discussions of various relations of venereal diseases to public health, and the showing of moving picture films and visits to various clinics were also planned. These are to be announced and arranged by appointment. Any one planning to atttend is urged to communicate with Dr. Donald B. Armstrong, Director, 370 Seventh Avenue, New York City.

THE COMMONHEALTH.

THE publication of this message from the State Department of Public Health for July and August, 1921, is one of the notable activities of this State Department and places before the people in an interesting way the facts relating to the management of communicable diseases. Every practitioner and public health worker should read every page. Indeed, every citizen who can read English should study it for the responsibility of community health is not confined to physicians.

"The Public Health Notations" should be printed on cards and hung in every doctor's office. It would also be well to have such a card sent to every householder in the state, with instructions for its display for every member to read.

The articles on the venereal diseases add chapters to the others of great value, and while the estimates of the rates of incidence are lower than have generally been supposed, the number of cases in the aggregate is large. The statement that the public must be educated in these matters is sound, but since the age at which this education should begin is debatable, why not have a circular letter distributed to all applicants for a marriage license with the hope that reference to the danger to children may lead a prospective parent whose memory may revert to forgotten exposures to take measures for the determination of the presence or absence of a disease which may be quiescent? The unborn child has rights which warrant state protection.

The Commonhealth is read by many. Everybody should study it.

PINE OIL EMULSION.

IT is gratifying to know that useful by-products from the waste of industry may contribute something of value to medicine. Stimson, of the Hygienic Laboratory of the U. S. Public Health Service, states that pine oil emulsion has a phenol coefficient of four to six, which remains fairly constant for two months, and the deterioration after that time could be made up by using more concentrated mixtures.

McCoy, Stimson and Hasseltine, of the Hygienic Laboratory of the U. S. Public Health Service, state that the pine oil emulsion is well adapted to the disinfection of intestinal discharges, such as typhoid fever, cholera and bacillary dysentery. It is less active against staphylococcus aureus. The oil is obtained by steam distillation of the refuse left after pine forests have been used for lumber and the southern pine furnishes a larger proportion of oil than northern.

The oil is pleasant smelling, with a specific gravity of 0.935 to 0.947, and is emulsified by the use of sodium hydroxid solution. The strength of the emulsion is employed in dilutions of one to five hundred, but since the time required for this to act is probably fifteen minutes or more, it is best to use it in the proportion of one to one hundred. It is not to be used for general disinfecting purposes because it has little effect on the spore-bearing microorganisms.

Unfortunately some manufacturers are putting out adulterated preparations containing kerosene and other mineral oils which have lessened efficiency.

MEDICAL NOTES.

INDEMNITY INSURANCE.—The committee appointed by the Council to report on this subject at the adjourned meeting in November will welcome information or suggestion relating to this matter.

Attempts are being made to secure group insurance in districts. It may be well to forward information of plans presented by agents so that the Committee can have a better understanding of the subject. Also it may be best to postpone adoption of any proposal until that Committee has made its report.

THE THIRTY-FIRST ANNUAL SESSION of the New York and New England Association of Railway Surgeons will be held at Hotel McAlpin, New York City, October 29, 1921. A most attractive program has been arranged at which some of the most eminent men in the profession will read papers and participate in discussions.

PUBLIC HEALTH SERVICE INSTITUTES. — In view of the great success of the Institute of the Public Health Service held in Washington last December and of the difficulty, due to the conflicting dates of other meetings, of arranging for another on the same scale this fall or winter, the Service some time ago decided to try to meet the insistent nation-wide demand by arranging a series of Institutes to be held in the larger widely scattered cities of the United States. Locations and dates were so arranged that at least two or three of the meetings should be held within reasonably convenient reach of nearly every resident of the country, and a tentative schedule of courses and of speakers was mapped out. The plans were promptly adopted by many cities, with some variations to meet special local needs.

Cities and dates so far listed are as follows: Hot Springs, Ark., some date in November; New Orleans, La., and Columbia, S. C., January 9-14; Dallas, Texas, and Birmingham, Ala., January 16-21; Memphis, January 23-28; Louisville, January 30-February 4; Indianapolis, February 13-16; Pittsburgh, February 20-25; Cleveland, February 27-March 4; Lansing, Mich., March 6-11; Chicago, March 13-18; Minneapolis, March 20-25; Portland, Ore., and Kansas City, Kan., April 10-15; Spokane, Wash., and Newark, N. J., April 17-22; Helena, Mont., and Albany, N. Y., April 24-29; Denver, May 1-6; Washington, D. C., in late May. Some dates in the schedule remain vacant, and these are being rapidly allotted.

The Institutes were planned to run for a week; and this length has been almost universally adopted. The basic courses include from three to six lectures on tuberculosis, child hygiene, nutrition, clinics, and health centers, communicable diseases, non-communicable diseases, industrial hygiene, sanitary engineering, administrative problems, mental hygiene, medical social work, syphilis, gonorrhea, protective social work, and the delinquent. Single lectures will also be given on special occasions. Two Institutes, those at Hot Springs and Chicago, will be devoted especially to venereal diseases.

The lecturers who will speak at some or all of the gatherings are the best available in their particular lines in the country. Among them are Frederick R. Green, John H. Stokes, A. J. McLaughlin, William C. White, Valeria Parker, W. F. Snow, W. A. Evans, and M. J. Rosenau.

ANTIQUATED METHODS IN MASSACHUSETTS.— In the analysis of the statistical report of infant mortality for 1920, published by the American Child Hygiene Association, with central office in Baltimore, the following sentence occurs: "Owing to the unsatisfactory and antiquated methods still followed in Massachusetts, figures were unobtainable from 23 of its 66 cities." This applies to the birth registration area from which the mortality statistics are taken. If the criticism is valid, Public Health organizations should unite and formulate methods for improving conditions.

THE January issue of the *Medical Review of Reviews* is to be sent as a New Year's gift to practically every physician in the United States and Canada. It is claimed this issue will be one of the most valuable which has ever been prepared and we trust that the physicians who receive this number will read it with interest and profit. We congratulate the *Medical Review of Reviews* on this progressive move and trust they will meet with success in a great undertaking.

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY. —The semi-annual meeting was held at the Boston Medical Library on Wednesday, October 19, 1921, at 12 o'clock, noon. Dr. Macfie Campbell, Director of the Psychopathic State Hospital, spoke on the work being done by the Committee of Mental Hygiene.

FREDERIC B. M. CADY, *Sec.*

MEETING OF RURAL HEALTH AND MEDICAL SERVICE COMMITTEE.—The Rural Health and Medical Service Committee held a meeting at the Medical Library Wednesday, October 5, following that of the Council. The letters and editorial references which have appeared in the JOURNAL regarding the aims and activities of this organization have aroused widespread interest. The Secretary reported having received letters and hearing otherwise from practitioners in rural districts in criticism of a growing spirit of "close corporation" discrimination toward their association with the larger hospitals such as would be helpful to them. "The welfare agencies, through their salaried nurses, are inaugurating such a health educational campaign that unless rural physicians are allowed better access to hospitals, or unless they can have hospitals, with their facilities and equipment within practical reach, such physicians are put to a great handicap and are subject to very unreasonable criticism from the public." How vital this matter is to the future welfare of the medical profession was shown by the way in which all present took part in the discussion which followed. Matters of finance and extension of membership were also talked over. The Chairman, Dr. Walter B. Cannon, and the Secretary, Dr. P. W. Goldsbury, were appointed a committee to confer with a committee of the Massachusetts Medical Society regarding these matters.

THE NORFOLK SOUTH DISTRICT MEDICAL SOCIETY held their October meeting Thursday, October 6, at the Norfolk County Hospital, Braintree Highlands. A very interesting paper was read by George P. Sanborn, M.D., serologist of the Boston City Hospital, on

specific treatment of pneumonia. Dr. Alfred J. Roach, Superintendent of the Hospital, conducted those present through the Hospital and explained the functions of the institution. Luncheon was served after the meeting. The next meeing of this Society will be held Thursday, November 3, 1921, at the United States Hotel, Boston.

RICHARD M. ASH, *Secretary*,
Norfolk South District Medical Society.

WHOOPING COUGH. — The Department of Health of the City of New York have entered upon a study of the value of pertussis vaccine because of the failure of observers to agree as to its efficacy. The suggestion is made that the lack of agreement may be due to lack of uniformity in the manufacture of this product. The result of this investigation will be most interesting.

DURING the week ending October 8, 1921, the number of deaths reported was 170 against 172 last year, with a rate of 11.70 against 11.99 last year. There were 25 deaths under one year of age against 36 last year.

The number of cases of principal reportable diseases were: Diphtheria, 40; scarlet fever, 11; measles, 23; typhoid fever, 3; tuberculosis, 31.

Included in the above were the following cases of non-residents: Diphtheria, 7; scarlet fever 1; tuberculosis, 4.

Total deaths from these diseases were: Diphtheria, 1; typhoid fever, 2; tuberculosis, 13.

THE OCTOBER MEETING of the Springfield Academy of Medicine was held at 137½ State Street, Tuesday, October 11, 1921, at 8.30 P.M. Dr. John A. Kolmer of Philadelphia read the paper of the evening, entitled: "The Present Status of the Wassermann Reaction with Special Reference to the Clinical Value of a Standardized Technic."

ALLEN G. RICE, *Secretary*.

WORCESTER DISTRICT MEDICAL SOCIETY.—The regular meeting was held at 8.15 P.M., Wednesday, October 12th, in Assembly room of Clark University.

The Worcester District North Medical Society accepted an invitation to unite with us at this time.

In addition to the regular program, Dr. John W. Bartol, President, Massachusetts Medical Society, addressed the meeting.

PROGRAM.

1. Acute and Chronic Inflammation of the Middle Ear, George L. Tobey, Jr., Boston.
2. The Duty of the Physician to Himself, His Confrères and to the Public at Large, Dr. E. H. Trowbridge, Worcester.

Wednesday, Nov. 9th, meeting to be held in Spencer.

Wednesday, Dec. 14th, meeting to be held at St. Vincent's Hospital.

JAMES J. GOODWIN, *President*.
A. W. ATWOOD, *Secretary*.

THE annual meeting of the American Child Hygiene Association, formerly the American Association for the Study and Prevention of Infant Mortality, the result of the Conference held by the American Academy of Medicine in Yale University, November, 1909, will be held November 2, continuing through November 5, in New Haven. The program will include the following subjects:

Coördination of Local, State, and National Child Health Activities; Health Education in the Home, and in Kindergarten—The Psychology of Health Education; Rural Problems—Nutrition, Habits, and County Centers; The Child of Pre-School Age—Psychology — Day Nurseries; The Problems and Opportunities of Lay Directors of Private Organizations; Special Problems of Directors of Divisions of Child Hygiene; Nursing—Volunteer Workers—Teaching Methods and Equipment in Health Programs for the Child under Six Years of Age.

The chairmen of the local committees are as follows: Prof. Irving Fisher, Local Arrangements; Mr. Philip S. Platt, State Membership; Mr. Donald W. Porter, Local Membership; Mr. J. Dwight Dana, Publicity; Mr. James C. Greenway, Hotel and Meeting Places; Mrs. Winchester Bennett, Local Transportation; Dr. Joseph I. Linde, Clinics.

IT is contended that health is purchasable. Public Health by the wise use of money and human agencies. Individual health by correct and moderate living, the fundamentals of which are abundance of pure air, wholesome food, exercise without overfatigue, and an adequate amount of sleep.

MOONSHINE WHISKEY is dangerous for those who drink it, and often for those who do not. Read the reports of accidents to others caused by muddled brains.

Obituaries.

FRANCIS PELEG SPRAGUE, M.D.

DR. FRANCIS P. SPRAGUE, an old-time ophthalmologist of Boston, died on October 6th, 1921, at the Somerset Club in Boston, at the age of eighty-seven. He was born in Washington, D. C., February 17, 1834, the son of Peleg and Sarah Deming Sprague, the former at one time a United States Senator. Dr. Sprague was a graduate of Harvard Medical School in the class of 1857 and joined the Massachusetts Medical Society in 1860. During the Civil War he was acting assistant surgeon in the

Army, and later was on duty in the Judiciary Square Hospital and also at the Demarres Eye and Ear Infirmary in his native city, being discharged from the service in February, 1864.

Settling in Boston, he became surgeon to the Massachusetts Charitable Eye and Ear Infirmary and obtained membership in the American Ophthalmological Society when it was founded.

Dr. Sprague had not practiced for many years, living in retirement during the winter on Commonwealth Avenue, and in the summer at Nahant. He was known as a friend to many public medical institutions and enterprises throughout his lifetime.

In 1868 he married a daughter of John Amory Lowell. She died in 1904, leaving no children.

Dr. Sprague was a member of the Boston Medical Library, the Boston Society of Natural History and the Somerset, St. Botolph, Country and Algonquin clubs.

MANY YEARS A DORCHESTER PHYSICIAN.

DR. JOHN HENRY MURPHY, for twenty-one years a practicing physician in Dorchester, died October 6 at his home, 716 Columbia Road, after an illness of three weeks. He was born in Roxbury forty-eight years ago and was a graduate of English High School and the Harvard Medical School, in the class of 1893. He is survived by his wife, Mrs. Elizabeth Wattendorf Murphy, and one daughter, Miss Collette Murphy.

Miscellany.

NEW AND NON-OFFICIAL REMEDIES.

DURING September the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Non-official Remedies:

The Abbott Laboratories: — Procaine-Adrenaline Hypodermic Tablets No. 2.

Dry Milk Co.—Protolac.

Hynson, Westcott and Dunning:—Tablets of Benzyl Succinate—H. W. and D.

Intra Products Co.—Ampules Ven Sterile Solution Mercury Oxycyanide 0.008 Gm. Ampules Ven Sterile Solution Mercury Oxycyanide 0.016 Gm.

Lederle Antitoxin Laboratories:—Acne Combined Vaccine.

Mead Johnson and Co.:—Casec.

N. Y. Intravenous Laboratory:—Loeser's Intravenous Solution of Mercury Oxycyanide.

Seydel Mfg. Co.:—Benzyl Succinate—Seydel.

Non-proprietary Articles: — Benzyl Succinate. Calcium Caseinate.

Yours truly,

W. A. PUCKNER, *Secretary*,
Council of Pharmacy and Chemistry.

Beebe Protein Milk.—Edweiss Milch of Finkelstein.—A modified milk preparation having a relatively low content of carbohydrate and fat and a relatively high protein content. Each 100 Gm. contains approximately solids 10.2 Gm., carbohydrate 2.5 Gm., protein (casein) 6.3 Gm., fat 1.6 Gm., and ash 0.8 Gm. The acidity is stated on each package.

Beebe Modified Buttermilk.—Buttermilk with Flour.—Buttermilk modified formula of Langstein and Meyer.—Buttermilk containing flour partially dextrinized by heat.—Each 100 Gm. contains approximately: total solids 9.7 Gm., carbohydrate 4.7 Gm., protein 3.3 Gm., fat 0.6 Gm., and ash 1.2 Gm. The acidity is stated on each package.

Mercuric Oxycyanide.—For a description see *New and Nonofficial Remedies*, 1921, p. 194. Mercuric Oxycyanide has been proposed as a substitute for mercuric chloride. Its antiseptic power is said to be greater and it is claimed to be less irritating than mercuric chloride, because it does not act on albumin to the same extent. Representative syphilographers differ as to the use of mercuric oxycyanide intravenously. Some believe that its use should be limited to hospitals; others that it has no advantage over other and safer methods of administering mercury, while others consider it safe and valuable. But all are in accord that its safe use requires experience. Mercuric oxycyanide may be administered subcutaneously, intramuscularly or intravenously in the same doses as mercuric chloride.

Loeser's Intravenous Solution of Mercury Oxycyanide.—Each ampule contains 5 Cc. of solution, representing 0.008 Gm., mercuric oxycyanide N. N. R. New York Intravenous Laboratory, New York.

Ampules Ven Sterile Solution Mercury Oxycyanide 0.008 Gm.—Each ampule contains 5 Cc. solution, representing 0.008 Gm. mercuric oxycyanide, N. N. R. Intra Products Co., Denver, Colo.

Ampules Ven Sterile Solution Mercury Oxycyanide, 0.016 Gm.—Each ampule contains 5 Cc. solution, representing 0.016 Gm. mercuric oxycyanide, N. N. R. Intra Products Co., Denver, Colo. (*Jour. A. M. A.*, Sept. 10, 1921, p. 863.)

Calcium Caseinate.—Calcii Caseinas.—Casein from cow's milk rendered partially soluble by combination with calcium and containing not less than 1 per cent. of calcium. The diarrheal diseases of infancy are now generally treated by dietetic measures. A useful food may be made from the curd of milk and di-

luted buttermilk, the resultant mixture containing a moderate amount of fat, a small amount of sugar and a large amount of protein (casein) and salts, particularly salts of calcium. A mixture of calcium caseinate and milk is also used. For children, calcium caseinate is mixed with milk and water or milk and gruel in the proportion of 10 Gm. calcium caseinate and one pint of the liquid and the mixture boiled. Calcium caseinate is a yellowish powder, free from rancid or sour odor. With warm water it forms a turbid suspension. Calcium caseinate must not contain more than 10 per cent. of moisture, nor more than 2.5 per cent. of fat and not less than 14 per cent. of nitrogen.

Casec.—A brand of calcium caseinate. N. N. R. Mead Johnson and Co., Evansville, Ind.

Benzyl Succinate.—Benzylis Succinas.—The dibenzyl ester of succinic acid. Benzyl succinate lowers the tone of unstriped muscle, its action being similar to benzyl benzoate in this respect. It is superior to benzyl benzoate in being less irritating, less nauseating and in containing a greater proportion of benzyl radicle. Its use has been suggested as a renal, biliary, uterine and intestinal colic, excessive intestinal peristalsis, dysmenorrhea, hiccough and other spasms of unstriped muscle. Its clinical use is still in the experimental stage. The dose is 0.3 to 1.0 Gm. Benzyl succinate is a crystalline, odorless and almost tasteless powder. It is almost soluble in water, but soluble in alcohol.

Tablets of Benzyl Succinate.-H. W. and D. —Each contains benzyl succinate, N. N. R., 5 grains. Hynson, Westcott and Dunning, Baltimore. (*Jour. A. M. A.*, Sept. 25, 1921, p. 1023.)

RÉSUMÉ OF COMMUNICABLE DISEASES AUGUST, 1921.

General Prevalence.

Of communicable diseases, 3,418 cases were reported during August as compared with 4,018 in July. This is the least number reported for any month this year. While in the aggregate there were fewer reports, there were slight increases in some of the more important communicable diseases.

Anterior Poliomyelitis—61 cases of poliomyelitis were reported during August as compared with 26 for July. The total for August, 1920 was 93. While these 61 cases represent reports from twenty-five cities and towns it has been evident that the disease has centered itself about four foci, one in the eastern, one in the northeastern and two in the western part of the state. Of the 61 reported cases, 48 occurred in one of these localities.

Diphtheria—516 cases were reported for this month as compared with 441 for July.

Dog-bite—20 cases of dog-bite requiring antirabic treatment were reported for this month. The records for the last five years show that this is the largest monthly total during that time. During 1918 only 20 cases of dog-bite were reported during the entire year.

Epidemic Cerebrospinal Meningitis was reported in 16 instances. Total for July, 14.

Gonorrhea and Syphilis showed increased reported incidence, 542 for the former and 191 for the latter. Totals for last month, 459 and 171 respectively.

Measles—268 cases were reported for this month as compared with 866 for July. This is the smallest monthly total since September, 1920.

Lobar Pneumonia was reported in 76 instances.

Scarlet Fever—For August, 232 cases were reported as compared with 251 for July.

Pulmonary Tuberculosis—For August, 619 cases were reported as compared with 503 for July. This increase is probably due to better reporting rather than to any actual increase in the number of cases.

Typhoid Fever—For August, 115 cases were reported. During the same period of 1920, 116 cases were reported. Nine of these cases were residents of neighboring states and were brought into Massachusetts to receive hospital treatment.

Whooping Cough—375 cases were reported as compared with 475 for the previous month.

RARE DISEASES.

Anterior Poliomyelitis was reported from Adams, 1; Arlington, 1; Athol, 1; Attleboro, 1; Becket, 1; Boston, 13; Cambridge, 1; Dalton, 2; Everett, 1; Fall River, 1; Haverhill, 7; Lawrence, 6; Lynn, 2; Medford, 1; Melrose, 1; Methuen, 1; Montague, 1; Newburyport, 1; North Adams, 4; Pittsfield, 3; Revere, 2; Springfield, 4; Waltham, 1; Wellfleet, 1; Westford, 2. Total, 61.

Dog-bite requiring anti-rabic treatment was reported from Boston, 2; Braintree, 1; Chelmsford, 1; Fall River, 2; Framingham, 1; Lawrence, 1; Lowell, 4; Natick, 1; North Adams, 2; Winthrop, 5. Total, 20.

Dysentery was reported from Boston 1; Holden, 1; Haverhill, 1; Ipswich, 1; Worcester, 1. Total, 5.

Epidemic Cerebrospinal Meningitis was reported from Boston, 3; Cambridge, 1; Dalton, 1; Fall River, 1; Framingham, 1; Haverhill, 1; Lee, 1; Leominster, 1; Lowell, 1; Revere, 2; Somerville, 1; Springfield, 1; Southbridge, 1. Total, 16.

Encephalitis Lethargica was reported from Boston, 1; Lynn, 1; Newton, 2; Winthrop, 1. Total, 5.

Malaria was reported from Boston, 2; Dedham, 1; Newton, 1; Winthrop, 1; Worcester, 1. Total, 6.

Pellagra was reported from Waltham, 1.

Septic Sore Throat was reported from Boston, 2; Lowell, 2; Springfield, 1. Total, 5.

Tetanus was reported from Beverly, 1; Boston, 1; Fall River, 1; Fitchburg, 1. Total, 4.

Trachoma was reported from Boston, 4; Chelsea, 2; Somerville, 1. Total, 7.

THE TUBERCULOSIS INSTITUTE.

THE Tuberculosis Institute will conduct meetings at the Massachusetts General Hospital, October 26 and 27, from 10 A.M. to 12.30 M., and from 2 P.M. to 4 P.M. each day, under the auspices of the Boston Tuberculosis Association.

A luncheon is to be served on the grounds of the Hospital at 12.45 each day, and the Association hopes that many of the physicians who attend the Institute will participate, in order that they may become better acquainted and meet visiting physicians.

A copy of the following letter is being sent to all the doctors in Boston and Greater Boston:

My dear Doctor:—

The Boston Tuberculosis Association will hold an Institute for Physicians, at the Amphitheatre of the Massachusetts General Hospital for two days, Wednesday and Thursday, October 26 and 27, on various subjects pertaining to pulmonary tuberculosis.

There will be a number of speakers who are well worth hearing, as well as clinics and demonstrations. A complimentary luncheon will be served each day to all those attending this Institute. I am, therefore, enclosing a return postal card and wish to have your reply as early as possible in order to complete arrangements for the luncheon.

I would strongly urge you to come to these meetings which offer an unusual opportunity of obtaining knowledge in regard to the recent advances in the study of pulmonary tuberculosis.

Sincerely yours,
CLEAVELAND FLOYD,
Chairman of Committee.

BOSTON INSTITUTE OF TUBERCULOSIS COMMITTEE.

Chairman, Cleaveland Floyd, M.D.
Edward O. Otis, M.D.
William C. Woodward, M.D.
John B. Hawes, 2d, M.D.
Randall Clifford, M.D.

The program is as follows:

BOSTON TUBERCULOSIS ASSOCIATION.
INSTITUTE FOR PHYSICIANS.

Morning, Wednesday, October 26, 1921, Dr. Floyd presiding.

10-11—Subject, Tuberculosis in the Community; speaker, Dr. James Alexander Miller, President, National Tuberculosis Association, New York City.

11-11.15—Subject, Regional Anatomy of the Lungs; speaker, Dr. Alexander S. Begg, Professor of Anatomy, Boston University, School of Medicine.

11.15-11.35—Subject, Pathology of Tuberculosis, with specimens; speaker, Dr. Lawrence W. Smith, Department of Pathology, Harvard Medical School, Boston, Mass.

11.35-12.05—Subject, Relation of Boards of Health to the General Practitioner in the Handling of Tuberculosis; speaker, Dr. William C. Woodward, City Health Commissioner, Boston, Mass.

12.05-12.35—Subject, Aid which the State Offers in Controlling Tuberculosis Through State Sanatoria and Consultation Clinics; speaker, Dr. Eugene R. Kelley, State Health Commissioner, Boston, Mass.

Afternoon, Wednesday, Dr. Hawes presiding.

2-3—Subject, What May Be Expected from Sanatorium Treatment; speaker, Dr. Vincent Y. Bowditch, Director Sharon Sanatorium, Sharon, Mass., and ex-President, Massachusetts Tuberculosis League.

3-4—Subject, Common Pulmonary Diseases Confused with Tuberculosis; speaker, Dr. Edward O. Otis, Professor, Tufts College Medical School, Boston, Mass., and President, Massachusetts Tuberculosis League.

Morning, Thursday, October 27, 1921, Dr. Floyd presiding.

10-11—Subject, Early Diagnosis of Tuberculosis; speaker, Dr. Lawrence Brown, Saranac Lake, N. Y., Trudeau Sanatorium.

11-11.30—Subject Artificial Pneumothorax and Postural Rest in the Treatment of Tuberculosis; speaker, Dr. Cleaveland Floyd, Director of the Outpatient Clinic, Boston Consumptives' Hospital.

11.30-12.30—Subject, Clinical Physical Signs of Tuberculosis; speaker, Dr. Richard Cabot, Professor of Medicine, Harvard University.

Afternoon, Thursday, Dr. Hawes presiding.

2-3—Subject, Laboratory Aids in the Diagnosis of Tuberculosis; speaker, Dr. Frederick T. Lord, Visiting Physician, Massachusetts General Hospital, Boston, Mass.

3-4—Subject, Correlation of Clinical Finding and X-ray in Cases of Tuberculosis; speakers, Dr. John B. Hawes, Director of Clinic on Pulmonary Diseases, Massachusetts General Hospital, and President, Boston Tuberculosis Association; Dr. Geo. W. Holmes, Roentgenologist, Massachusetts General Hospital, Boston, Mass.

So much interest has been shown in the Tuberculosis Institute that arrangements have been made to accommodate a larger attendance than was originally planned for, so that physicians interested in the subjects to be presented will be cordially welcomed.

BOSTON MEDICAL HISTORY CLUB, 8 The Fenway, Boston, Mass.—Meeting, Thursday, October 20, 1921, 8.15 P. M. Program:

Adoption of Constitution and By-Laws.
Presentation of Books.
Paper on "Nicolaus Cusanus," Dr. Henry Viets:
Discussion. EDW. C. STREETER, *Secretary.*

APPOINTMENT.

DR. OSCAR M. SCHLOSS has been appointed Professor of Pediatrics at Harvard Medical School and also is in charge of the Medical Service at the Children's and Infants' Hospital.

Oscar M. Schloss, S.B., 1901, Alabama Polytechnic, M.D., 1905, Johns Hopkins University, was born in 1882. He was Resident Physician of Kings County Hospital, Brooklyn, N. Y., from 1905-1907; Resident Physician of the New York Nursery and Child's Hospital from 1907-1908; Assistant Attending Physician from 1909-1911; Attending Physician from 1911-1919; Director of the Pediatric Service from 1919-1921. He was also Assistant Attending Physician of the Willard Parker and Riverside Hospitals from 1909-1913; Attending Physician, the children's wards of Bellevue Hospital from 1912-1918; Attending Physician of Babies' Hospital from 1918-1919; Assistant in Pediatrics at New York University and Bellevue Hospital Medical College from 1909-1912; Instructor in Pediatrics at the College of Physicians and Surgeons and Columbia University from 1912-1919; Professor of Pediatrics at Cornell University from 1919-1921. He is a member of the American Pediatric Society, the American Society for Clinical Investigation, and The Society for Serology and Hematology.